FACULTY OF ENGINEERING

M.E. (Civil-SE) II-Semester (AICTE) (Make-up) Examination, July 2021

Subject: Retrofitting and Rehabilitation of Structures

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

Note: i)　First Question is compulsory and answer any Three questions from the remaining six questions.
　　　ii)　Answers to each question must be written at one place only and in the same order as they occur in the question paper.
　　　iii)　Missing data, if any may suitably be assumed.

1.　Answer any Four question from the following　　　　　**(4 x 4 = 16 Marks)**
　　a)　What are the various causes of deterioration of structures?
　　b)　What are construction failures?
　　c)　Write a short note on thermal cracking in concrete structures.
　　d)　What is the need for polymer concrete?
　　e)　What are corrosion inhibitors?
　　f)　List out the various common types of repairs in concrete structures
　　g)　List any four heath monitoring techniques for dilapidated structures.

2.　a)　Discuss the important parameters in repair and rehabilitation of structures.　　9
　　b)　Explain the condition assessment and distress – diagnostic techniques.　　9

3.　a)　Discuss serviceability and durability of concrete structures .　　9
　　b)　Explain the accelerated strength gain in concrete　　9

4.　a)　What is fiber reinforced concrete and how it is useful in repairing concrete Structures?　　9
　　b)　What is epoxy injection and why it is proposed for concrete　　9

5.　a)　Differentiate between shoring and underpinning　　9
　　b)　Explain sulphur infiltrated concrete and where it is used　　9

6.　What are the various retrofitting techniques carried out on a distressed beam element?　　18

7.　a)　Explain the engineered demolition techniques for dilapidated structures　　9
　　b)　Explain the procedure for health monitoring of structures　　9

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FACULTY OF ENIGNEERING
M.E. (Civil-SE) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: Design of Prestressed Concrete Structures

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

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.

    (ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.

    (iii) Missing data, if any, may suitably be assume.

1 **Answer any four questions from the following:**   **(4x4=16 Marks)**

  (a) Explain the need of high strength steel and high strength concrete in Pre-Stressing technique.

  (b) What is the basic principle of Pre-Stressed Concrete?

  (c) Differentiate between linear and circular prestressing.

  (d) What is the load balancing method?

  (e) What are the assumptions made in the analysis of Pre-Stressed Concrete?

  (f) Explain how the shear resistance of concrete is improved in Pre-Stressed Concrete?

  (g) Explain kern point.

2 (a) What are the different systems of Prestressing? Explain.   6

  (b) A pre-tensioned beam 150 mm wide and 250 mm deep is pre-stressed by 6 wires each of 6mm diameter initially stressed to 1200 N/mm^2 with their centroids located at 75 mm from the soffit of the beam. Estimate the final percentage loss of stress due to elastic deformation, creep, shrinkage and relaxation using the following data: relaxation of stress in steel = 3%, E_s = 2.10 x 10^5 N/mm^2, creep coefficient (CC) = 1.6, Residual shrinkage strain = 3 x 10^{-4}.   12

3 (a) Explain shear failure in PSC beams.   6

  (b) A beam of rectangular cross section 150 mm x 300 mm has an eccentricity zero at supports. A parabolic cable with 12 m span is provided. The beam is subjected to a udl of 12 kN/m in addition to its own weight. The beam is pre-stressed with an effective pre-stress of 100 kN.

    Find:

    (i) The principle stresses at supports.

    (ii) Magnitude of principle stress at supports in the absence of pre-stress.   12

4 (a) Write the importance of deflection in Prestressed Concrete members.   6

  (b) A PSC beam of rectangular section is 200 mm x 300 mm and has a span of 10m. The beam is provided with a straight tendon at a uniform eccentricity of 50 mm, the prestressing force being 75 KN.

    (i) Find the deflection at the centre under the action of prestress + DL of the beam.

    (ii) Under the action of prestress + DL and a LL of 5 KN/m and including the effect of creep and shrinkage, taking the creep coefficient as 1.0 and F_k = 40 N/mm^2. Compare these deflections with permissible limits.   12

5 (a) Write the advantages of continuous beams.   6
   (b) A continuous beam ABC (AB = BC = 10m) is pre-stressed by a parabolic cable
       carrying an effective force of 75 KN. The cable profile is varying parabolically with
       100 mm eccentricity at the middle of each span. The eccentricity at mid supports is
       75mm. The beam supports dead and live loads of 1.0 KN/m and 3 KN/m respectively.
       Calculate the resultant moments developed in the beam and locate the pressure line. 12

6 Design a post tensioned prestressed concrete two way slab for 10 m by 12 m with
   discontinuous edges to support an imposed load of 3 KN/m^2. Cables of 7 wires of 5 mm
   diameter carrying an effective force of 100 KN are available for use. Design the spacing
   of cables in the two directions and check for the safety of the slab against collapse and
   excessive deflection at service loads. Assume f$_{ck}$ = 40 N/mm^2, f$_p$ = 1500 N/mm^2 and
   E$_c$ = 38 kN/mm^2.   18

7 Write short notes on the following:
   (a) Anchorage reinforcement and End zone stresses.   9
   (b) Types of cable profiles.   9

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FACULTY OF ENIGNEERING
M.E. (Civil-SE) II-Semester (AICTE) (Makeup) Examination, July 2021

Subject: Advanced Concrete Technology

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

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.
     (ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
     (iii) Missing data, if any, may suitably be assume.

1 **Answer any four questions from the following:**   **(4x4=16 Marks)**
  (a) Explain the chemical composition of Ordinary Portland Cement.
  (b) Explain the term Bulking of Sand.
  (c) State the influence of w/c ratio on the compressive strength of concrete.
  (d) What are the different factors influencing bleeding of concrete?
  (e) Explain any four factors influencing the choice of mix design.
  (f) State the advantages and application of Ferro cement.
  (g) State limitations of Abram's law.

2 (a) Classify cement based on IS 456. Explain about any four types of blended cements.   9
   (b) What is meant by Alkali Aggregate reaction? State different factors promoting this reaction.   9

3 (a) Classify different types of admixtures used in the concrete. Explain in detail about mineral admixtures.   9
   (b) How the workability of concrete is measured by slump and compaction factor test?   9

4 Design a concrete mix for a reinforced concrete work having below particulars using IS: 10262 – 2009.   18
    a. Design strength = 35 Mpa.
    b. Max. size of aggregate =20 mm.
    c. Grade of cement = 53 Grade.
    d. Degree of workability = 65 mm. slump.
    e. Degree of quality control = Good.
    f. Type of Exposure = Severe.
    g. Zone of sand = III
    h. Sp. Gravity of Cement = 3.15
    i. Sp. Gravity of F.A = 2.58
    j. Sp. Gravity of C.A = 2.6
    k. Water absorption of CA= 1%
    l. Compressive strength of cement at 7 days = Satisfies the requirement of IS:269-1989.
    m. Sand content = 35% of Total Aggregate
   Assume any required data suitably.

5 (a) Explain the method of calculating Modulus of elasticity and Poisson's ratio of
       concrete using lab experiments.   7
   (b) Explain expansion mechanism of sulphates in concrete. Explain how to improve
       properties of concrete against sulphate expansions.   7
   (c) Explain the role of different admixtures used during preparation of high strength
       and high performance concrete.   4

6 (a) What is meant by compaction of concrete? Explain different methods of compaction
       of concrete.   9
   (b) Explain different methods used in preparation of high strength concrete.   9

7 Write short notes on the following:
   (a) Electrochemical behaivour of concrete.   7
   (b) Non destruction test on concrete.   7
   (c) Importance of water-cement ratio and Gel-space ratio in deciding compressive
       strength of concrete.   4

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FACULTY OF ENGINEERING

M.E (Civil - TE) II-Semester (AICTE) (Make-up) Examination, July 2021

Subject: Statistical Techniques

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

Note: i) First Question is compulsory and answer any Three questions from the remaining six questions.

ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.

iii) Missing data, if any may suitably be assumed.

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1. Answer any Four question from the following   **(4 x 4 = 16 Marks)**

a) Compare Mean, Median and Mode as a measure of location of a distribution

b) Define Skewness and Kurtosis.

c) A family consisting of 5 children' find the probability of getting least One female, child

d) Discuss the main difference between Correlation and Regression with a suitable example.

e) Define Time Series. What are the different components of Time series

f) Write a short note on Box Plot method

g) What is principle component Analysis.

2. a) Explain the concept of Sampling. Discuss Briefly different types of Sampling   9

b) Find all the samples of size 2 with and without replacement from 2, 4, 6l 10, 12 Show that sample mean is an unbiased estimate of population mean.   9

3. a) Compute the rank correlation coefficient for the following data.   9

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	69	68	48	50	70

b) A Certain manufacturing process yield electrical fuses, of which in the long run, 15% are defective. Find the probability that in a sample of 10 fuses selected at random, there will be (i) no defective   (ii) atleast on defective   9

4. a) From a population of 540, a sample of 60 individulas are taken from this sample, a mean is found to be 6.2 and the standard deviation 1.38. (i) Find the estimated standard error of mean and (ii) construct 95% confidence interval of mean.   7

b) Two random samples gave the following results. Test whethethe sample come from the same Normal population at 5% level of significance. (the tabulated value is 2.9)   11

Sample	Size	Sample mean	Sum of squares Of distribution of mean
1	10	15	90
2	12	14	108

5. a) The number of aircraft accidents that occurred during the seven days of a week are given below. 9

Days	Sun	Mon	Tue	Wed	Thu	Fri	Sat
No. of accidents	12	14	18	12	13	19	14

Find whether accidents are uniformly distributed over a week. Table value at 5% los is 12.592

b) Explain large sample test of Significance for difference of proportions. 9

6. a) Draw a trend line for the following data by free hand method and estimate the value for year 2010. 9

Year	2000	2001	2002	2003	2004	2005
Production in tones	25	29	35	22	18	30

b) Define point and interval estimation and explain the maximum likelihood estimation. 9

6. a) Explain chi-Squares test for goodness of fit. 7

b) Define Normal distribution and explain how it is useful in highway and traffic engineering. 11

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FACULTY OF ENIGNEERING

M.E. (Civil-CEM) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: TQM Techniques in Construction Management

Time: 2 Hours   Max. Marks: 70

Note: (i) First question is compulsory and answer any three questions from the
        remaining six questions.
      (ii) Answer to each question must be written at one place only and in the same
        order as they occur in the question paper.
      (iii) Missing data, if any, may suitably be assume.

1 **Answer any four questions from the following:**   **(4x4=16 Marks)**
   a) What are the elements of total quality management?
   b) What are merits and demerits of Total quality management?
   c) What are the factors of leadership?
   d) Explain Pareto Analysis.
   e) Why is ISO 9000 important?
   f) What are the five dimensions of learning organization?
   g) Define lean construction.
   h) What are six Cs for successful Implementations of TQM?

2 Explain briefly Quality management in construction industry.   [18]

3 a) Differentiate between manager and leader.   [9]
   b) Explain three major styles of leadership.   [9]

4 a) Explain the clauses structure of ISO 9000:2015.   [9]
   b) Differentiate formal quality assurance and quality assurance.   [9]

5 Discuss in detail team for total quality management in construction industry.   [18]

6 Explain briefly tools of lean construction with case study.   [18]

7 a) Discuss in detail cultural change in construction.   [9]
   b) Describe road to quality management.   [9]

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FACULTY OF ENIGNEERING

M.E. (EEE-PE/PES) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: Static Control of DC Drives

Time: 2 Hours   Max. Marks: 70

Note: (i) First question is compulsory and answer any three questions from the
remaining six questions.
(ii) Answer to each question must be written at one place only and in the same
order as they occur in the question paper.
(iii) Missing data, if any, may suitably be assume.

1 Answer any four questions from the following: (4x4=16 Marks)

   a) Draw the speed torque characteristics of three phase half controlled converter fed
      separately excited DC motor drive.
   b) Why does the power factor become low when the firing angle is increased in phase
      controlled converters?
   c) List the different methods by which the speed reversal can be obtained in DC motor drive.
   d) What do you mean by braking? List the different braking methods.
   e) List the various advantages of closed loop control over open loop control.
   f) Differentiate between ideal and Non-ideal dual converters.
   g) Give the speed-Torque equations of separately excited DC motor and DC series motor.

2 a) Explain the operation of single phase fully controlled converter fed separately excited
      DC motor drive with necessary equations, waveforms and characteristics.   [9]
   b) A 220V, 960 rpm 12.8A separately excited dc motor has armature resistance of 2 Ω.
      It is fed from a single phase half controlled rectifier with an ac source voltage of 230V,
      50Hz. Calculate
      (a) Motor torque for $\alpha=60^0$ and speed = 600rpm
      (b) motor speed for $\alpha=60^0$ and T = 20N-m.   [9]

3 a) What do you mean by power factor improvement in phase controlled converter? Explain
      the symmetrical angle control of improving the power factor in phase controlled
      converters.   [9]
   b) What is the necessity of connecting converters in series? Explain the operation of
      single phase series semi converters with neat circuit, waveform and obtain the
      relevant equations.   [9]

4 a) What do you mean by dual converter with non-circulating current mode of operation?
      Explain the control strategies when
      i) control signal polarity selects the converter
      ii) the load current selects the converter.   [12]
   b) List the advantages and disadvantages of with and without circulating current mode of
      operation of dual converter.   [6]

5 a) What is the necessity of filter in chopper fed DC drive? Design an input filter feeding
      a DC motor drive and obtain the equation of *n*th harmonic current.   [9]
   b) Explain the dynamic braking of phase controlled separately excited DC drive with neat
      sketch and speed torque characteristics.   [9]

6 Derive the transfer function of the separately excited motor and its associated control
   components that are used to assess the dynamic response of the drive.   [18]

7 a) Explain how the speed reversal is obtained using change over contactors with neat
      circuit and waveforms.   [9]
   b) Explain the operation of single phase fully controlled converter fed DC series motor
      drive with necessary equations and waveforms.   [9]

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FACULTY OF ENGINEERING
M.E. (EEE-PE/PES) II - Semester (AICTE) (Make-up) Examination, July 2021

Subject: Renewable Energy Sources

Time: 2 Hours   Max. Marks: 70

Note: i) First question is compulsory and answer any three questions from the remaining six questions.
ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
iii) Missing data, if any, may suitable be assumed.

1. **Note: Answer any four questions from the following.**   (4 x 4 = 16 Marks)
   a) What are primary and secondary energy sources?
   b) What are direct, beam and diffuse radiation? Indicate on a diagram?
   c) What is the average voltage per fuel cell? List the various types of fuel cells?
   d) Define lift, drag and tip-speed ratio.
   e) What is the principle of operation of an OTEC plant?
   f) How are liquid bio-fuels obtained?

2. a) What is the principle of operation of a fuel cell? Explain the main components of a fuel cell system with a diagram.   (9)
   b) Explain the operation, advantages and dis-advantages of molten-carbonate cell.   (9)

3. a) What are the two basic types of instruments for solar radiation measurement? Explain the various types of instruments to measure beam radiation with Diagrams.   (9)
   b) Explain about solar radiation on titled surface and give its advantages over concentrating surfaces.   (9)

4. a) Draw the graph of power generated Vs wind speed? Mark the following on the graph and explain them i. Available wind power ii. Rated Power iii. Furling speed iv. Cut-in-speed.   (9)
   b) From first principles, develop equation for power generation by wind power and show that maximum power is 0.595 of P_{total}.   (9)

5. a) Derive the expression for the total annual power generation of a double bible tidal power plant.   (9)
   b) What is the main characteristic of the earth to be observed for setting up a geothermal power plant? Give the classification of the earth's surface based on temperature.   (9)

6. a) Explain the following: (9)
      i. Batch fermentation and continuous fermentation
      ii. Wet and dry fermentation
      iii. The two steps of photosynthesis.
   b) List and explain the factors for site selection of a biogas plant.   (9)

7. a) Discuss the renewable energy scenario in India.   (9)
   b) What are the issues in connecting the renewable energy systems to the grid? Explain each briefly?   (9)

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FACULTY OF ENGINEERING

M.E. (ECE-DS) II-Semester (AICTE) (Make-up) Examination, July 2021

Subject: Image and Video Processing

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

Note: i) First Question is compulsory and answer any Three questions from the
            remaining six questions.
      ii) Answers to each question must be written at one place only and in the same
            order as they occur in the question paper.
      iii) Missing data, if any may suitably be assumed.

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1. **Answer any Four question from the following**   **(4 x 4 = 16 Marks)**
   a) State the periodicity property of a 2D Discrete Fourier Transform.
   b) What is contrast stretching in image processing
   c) What is weighted averaging filter. State its significance.
   d) Define Shannon's noiseless coding theorem.
   e) State the advantages and disadvantages of Huffman coding.
   f) Represent an Analog video signal.
   g) Distinguish between forward motion estimation and backward motion estimation.

2. a) Describe the digital image formation model. Mention the three types of adjacency
        between the pixels.   9
   b) Explain 2D wavelet based sub band coding.   9

3. a) Distinguish between Histogram equalization and Histogram matching.   9
        If the intensity values in an image have Probability Density Function

        $P_r(r) = \dfrac{zr}{(L-1)^2}$ for $0 \le r \le L-1$ and 0 otherwise, show that the result of applying

        the transformation produces a uniform PDF.
   b) Explain Homomorphic filtering and state its significance.   9

4. a) Which type of redundancy does LZW coding remove? Explain the procedure for
        LZW coding   9
   b) Explain the two types of Predictive coding.   9

5. a) Explain the two types of projections in Geometric Image formation.   9
   b) Compare the sampling lattices for Progressive and Interlaced scans.   9

6. a) Explain about the optical flow ambiguity in motion estimation.   9
   b) Describe the features of Hard and Soft Threshold Robust Estimators in Global
        Motion Estimation.   9

7. Write short notes
   a) Basic Intensity Transformations   7
   b) Data Redundancy   7
   c) Video quality measures   4

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FACULTY OF ENIGNEERING
M.E. (ECE-DS) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: Optical Fiber Communication Systems

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

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.

(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.

(iii) Missing data, if any, may suitably be assume.

1 **Answer any four questions from the following:**   **(4x4=16 Marks)**

   a) Define numerical aperture and acceptance angle of an optical fiber.

   b) Compare LED and LASER diodes.

   c) Draw the block diagram of an optical receiver.

   d) An average optical power launched into a 10 Km length of fiber is 100 µW and the average output power is 2.5 µW. Calculate the signal attenuation in dB through the fiber.

   e) Name the different topologies used in optical network.

   f) Mention the applications of SONET.

2 a) Draw the simple block diagram of an optical fiber transmission link and explain the function of each block.   [9]

   b) Explain in detail about intermodal dispersion in an optical fiber.   [9]

3 a) Discuss the principle of operation of LASER diode as an optical source.   [9]

   b) Describe the operation of Avalanche photodiode with necessary diagram.   [9]

4 a) Explain in detail about the link budget analysis of optical fiber.   [9]

   b) Explain the optical receiver performance in terms of receiver sensitivity and bit error rate.   [9]

5 a) Discuss the concept of WDM with neat block diagram and mention its applications. [9]

   b) Explain the basic operation of an optical amplifier with a neat diagram.   [9]

6 a) Explain the architecture of SONET.   [9]

   b) Explain the operation of broadcast and select WDM networks.   [9]

7 Write short notes on any two of the following.   [9+9]

   a) Losses in optical fiber

   b) Erbium Doped Fiber Amplifier

   c) Optical CDMA

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FACULTY OF ENIGNEERING
M.E. (ECE-ES) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: Energy Harvesting Technology and Power Management for IOT Devices

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

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.
    (ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
    (iii) Missing data, if any, may suitably be assume.

1   **Answer any four questions from the following:**   **(4x4=16 Marks)**

    a) What is the basic principle involved in Electromagnetic energy harvesting?
    b) Why power consumption is playing vital role in WSN?
    c) What is the need of WSN in Structural Health Monitoring?
    d) Give electric equaling model of a PZT.
    e) Explain the following with respect to PV Cell
      i) Fill Factor   ii) Efficiency   iii) Peak watt
    f) Classify the magnetic materials and Give examples for each.

2   a) Explain the second generation PV cell with its structure diagram.   [10]
    b) Explain the operation of Thermo electric harvester.   [8]

3   a) Explain the Micro fabricated coil construction, and show the relationship between Coil resistance and Number of turns.   [8]
    b) Explain the principle of operation of any two SSD techniques.   [10]

4   a) Classify energy reservoirs and explain each of them.   [10]
    b) Compare various potential power sources for WSN.   [8]

5   a) Explain the operation of switching AC-DC power conditioner.   [10]
    b) Explain any two losses involved in power conditioning.   [8]

6   a) Explain the issues in RF energy harvesting.   [10]
    b) Draw and explain the block diagram of inductive coupling link system.   [8]

7   a) Explain any three issues in SHM using WSN.   [8]
    b) Explain how electric power is generated in semiconductor PV cell.   [10]

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FACULTY OF ENGINEERING

M.E (ECE-ES,ES & VLSI) II-Semester (AICTE) (Make-up) Examination, July 2021

Subject: VLSI Physical Design

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

Note: i) First Question is compulsory and answer any Three questions from the
             remaining six questions.
       ii) Answers to each question must be written at one place only and in the same
             order as they occur in the question paper.
      iii) Missing data, if any may suitably be assumed.

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1. **Answer any Four question from the following**   **(4 x 4 = 16 Marks)**
   a)   What is EDIF format and how it helps in tool integration

   b)   What is formal verification

   c)   Draw the bipartite graph and direction graph and highlight differences.

   d)   Differentiate between slicing tree and wheel floorplan methods

   e)   What is logic level simulation

   f)   What are selector nodes and distributor nodes.

   g)   Give the HDL code of following function $y = x1. X2+x2.x3. x4$

2. Mention the three design domain with Gajski's Y chart and explain the top down
   design methodology   18

3. a) Enlist the four situations in which layout compaction can be applied   10
   b) Draw the layout diagram of a CMOS inverter   8

4. a) Describe in detail the floor plan sizing for a piecewise liner shape function.   10
   b) What are the optimization problems in floor planning   8

5. a) Mention the three types of delay models   10
   b) Explain switch level modeling with 5 strength values using an example   8

6. For the function f (X1 XOR X2) (X3 XOR X4), draw and explain the two possible
   ROBDD's of a favourable variable ordering and less favourable variable ordering   18

7. a) Consider an eight operation function i=a+b+c+d+e+f+g+h. Obtain the most serial
      and most parallel DFG and explain its effect on critical path   10
   b) Elaborate on time constrained and resource constrained synthesis   8

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FACULTY OF ENIGNEERING
M.E. (ECE-ES, ES & VLSI) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: Wireless Access Technologies

Time: 2 Hours   Max. Marks: 70

Note: (i) First question is compulsory and answer any three questions from the
 remaining six questions.
 (ii) Answer to each question must be written at one place only and in the same
 order as they occur in the question paper.
 (iii) Missing data, if any, may suitably be assume.

1 **Answer any four questions from the following:**   (4x4=16 Marks)
   (a) Define Fixed and Nomadic Networks.
   (b) Name the Wireless access Technologies.
   (c) Write Applications of hotspot.
   (d) Write about Mesh network topology in Wireless Networks.
   (e) Write about Bluetooth standard.
   (f) Describe Carrier to Interface ratio (C/R) in Wireless Networks.
   (g) Brief about Wireless Data Application Service Providers (WDASP).

2 (a) What are the main advantages of Radio for Fixed Network access?   9
   (b) Discuss about the coverage offered by Wireless Networks.   9

3 (a) Explain the criterions for frequency band allocations.   9
   (b) Explain the Point to Multipoint Radio System with neat diagram.   9

4 (a) Explain the HIPERLAN.   9
   (b) Brief about the Ad Hoc Wireless Networks.   9

5 (a) Discuss about the Network Complexity in Wireless Networks Planning.   9
   (b) What are the Security issues in Wireless Networks?   9

6 (a) Discuss about the software requirements wireless access Networks.   9
   (b) Discuss about PC wireless interface equipment.   9

7 (a) Explain the Multichannel Multipoint Distribution Services (MMDS).   9
   (b) Explain any to any Fixed wireless access networks.   9

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FACULTY OF ENGINEERING

M.E (ECE-ES & VLSI D) - II-Semester (AICTE) (Make-up) Examination, July 2021

Subject: LOW POWER VLSI DESIGN

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

Note: i) First Question is compulsory and answer any Three questions from the remaining six questions.

ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.

iii) Missing data, if any may suitably be assumed.

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1. **Answer any Four question from the following**   **(4 x 4 = 16 Marks)**
   a) What are the various sources of power dissipation in digital IC's?

   b) Differentiate between Static CMOS and Dynamic CMOS.

   c) Why Energy-Delay Product is used as a metric?

   d) Differentiate between zero skew Vs. Tolerable skew.

   e) Mention some of the Power Estimation Techniques.

   f) How can we reduce power Estimation Techniques.

   g) How can we reduce power dissipation in memory subsystem?

2 a) Write on Dynamic power dissipation in CMOS in detail   10
   b) Elaborate the effects of Vdd & Vt on SPEED   8

3. a) Explain the implementation of adiabatic buffer circuit   9
   b) Explain about Variable – Threshold CMOS (VTCMOS) Circuit.   9

4. a) Explain how power minimization can be achieved with circuit Parallelization?   9
   b) Write a brief note on RTL power estimation.   9

5. a) Critique various sources of power dissipation in DRAM and SRAM.   9
   b) Explain about leakage current reduction in low power SRAM circuits   9

6. a) What are the need of energy recovery circuits in low power circuit techniques. 9
   b) Critique on Chip & package co-design of clock network   9

7. Write Short notes on any TWO of the following   9+9
   a) Co-design for low power
   b) Power minimization techniques
   c) Recent technology innovations in low power VLSI

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FACULTY OF ENIGNEERING
M.E. (Mech-CAD/CAM) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: Robotic Engineering

Time: 2 Hours   Max. Marks: 70

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may suitably be assume.

1 **Answer any four questions from the following:**   **(4x4=16 Marks)**
   a) What is mobility of a manipulator?
   b) Distinguish between dexterous and reachable workspace of a manipulator.
   c) Explain the use of transformation matrix.
   d) Explain how voronoi graph is used in mobile robots.
   e) Explain the principles involved in Newton –Euler and Lagrange methods of Dynamic analysis .Which method is more suitable for design of robot links.
   f) Distinguish between acoustic sensors and pneumatic sensors.

2 a) Explain the three methods of specifying orientation of the end-effector. Differentiate work space and work envelope.   [9]
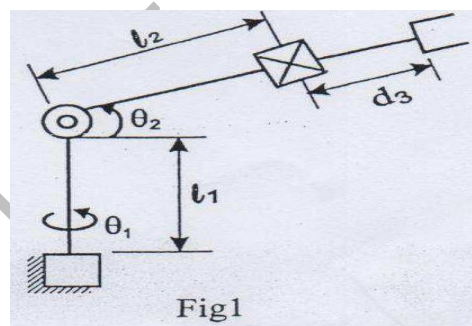   b) Explain any two mechanisms of pneumatics grippers used in robots.   [9]

3 For the 3-DOF (RRP) manipulator shown in below Fig:1,Obtain the joint variables and derive the direct kinematic model using Denavit - Hartenberg notation.   [18]

Fig1

4 Determine (a) Jacobian (b) Singularities and (c) Joint velocities for a 2-DOF Planar arm with revolute joints.   [18]

5 Derive the Dynamic model for a 2-DOF, RR Robot arm using LaGrange-Euler Formulation.   [18]

6 a) Explain the working of Force/torque sensor and Hall effect sensor with neat sketches.   [9]
   b) Explain the Processes involved in machine vision.   [9]

7 Write short notes on the following: [18]
   a) DH -Convention
   b) Drives used in industrial robots
   c) Path Planning and Trajectory Planning

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FACULTY OF ENGINEERING

M.E (Mech – CAD/CAM) II-Semester (AICTE) (Make-up) Examination, July 2021

Subject: Optimization Techniques

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

Note: i) First Question is compulsory and answer any Three questions from the remaining six questions.

       ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.

       iii) Missing data, if any may suitably be assumed.

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1. **Answer any Four question from the following**   **(4 x 4 = 16 Marks)**
    a) Define random and pseudo random numbers in simulation

    b) Explain laplace and Hurwicz alpha criteria in decision theory

    c) State methods used in solving integer programming

    d) List application of dynamic programming

    e) Explain any two methods for solving non linear programming problems

2. a) State advantages of simulation   6
    b) A manufacturing company keeps stock of a special product. Previous experience indicates the daily demand as given below

Daily demand	5	10	15	20	25	30
probability	0.01	0.20	0.15	0.50	0.12	0.02

    Use the following sequence of random numbers to simulate the demand for the next 10 days
    Random numbers:
    82, 96, 18, 96, 20, 84, 56, 11, 52, 03
    Also calculate the daily average demand for the product on the basis of simulated data   12

3. Consider the following pay off matrix   18

Alternative	State of nature			
	1	2	3	4
A_1	5	10	18	25
A_2	8	7	8	23
A_3	21	18	12	21
A_4	30	22	19	15

    Solve the problem and find which strategy should be concerned
    a) Maximin criterion   b) Maximax criterion
    c) Minimax regret criterion   d) laplace criterion

4. Solve the following problem by using using branch and bound algorithm   18
   Maximize $z = 2x_1 + 3x_2$

   $$x_1 + 3x_2 \leq 10$$
   $$x_1, x_2 \geq 0 \text{ and integers}$$

5. Solve the following problem by using dynamic programming method   18
   Maximize $z = 3x_1 + x_2$

   $$2x_1 + x_2 \leq 6$$
   $$x_1 \leq 2$$
   $$x_2 \leq 4$$
   $$x_1, x_2 \geq 0$$

6. Solve the following non linear programming problem using khun-tucker condition   18
   Maximize $z = 2x_1 + 3x_2$

   $$x_1^2 + x_2^2 \leq 20$$
   $$x_1, x_2 \geq 0$$

7 a) Explain integer linear programming techniques   9

   b) State Bellmans principle of optimality   9

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FACULTY OF ENGINEERING

M.E. (Mech. – CAD / CAM) II - Semester(AICTE) (Make-up) Examination, July 2021

Subject: Design of Press Tools

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

*Note: i) First question is compulsory and answer any three questions from
   the remaining six questions.*
       *ii) Answers to each question must be written at one place only and in
           the same order as they occur in the question paper.*
       iii) Missing data, if any, may suitable be assumed.

1. **Answer any four questions from the following.**   **(4 x 4 = 16 Marks)**

    a) What are safety devices used in press tools.

    b) What are contents of selecting while ordering die sets

    c) What are air cushions in press tools

    d) What is results of excessive die clearance?

    e) State the difference between embossing and coining

    f) State different forming dies

    g) What is bulging operation

2. a) Explain the specification of general presses.   9

    b) Sketch and explain the location of regular and irregular shapes.   9

3. a) Explain punch design procedure for blanking operation.   9

    b) Determine the force necessary to strip the stock material from the punch when blanking the work

    piece for the figure shown below. Assume the cut edges to be 0.04 mm apart and 0.04 mm for the strip

    edge-figure. The figure 1 is half hard steel with ultimate shearing stress 37KN/m^2.   9

fig 1
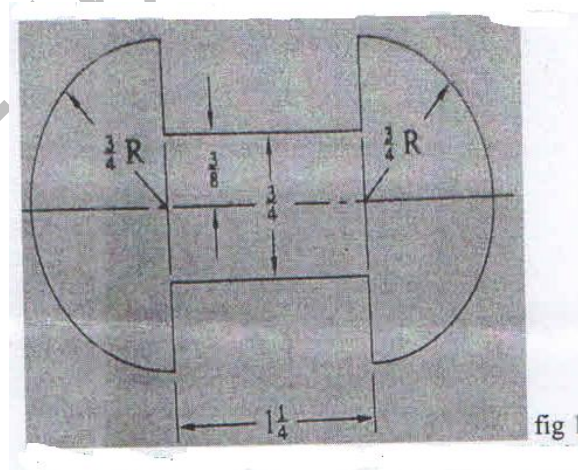
4. a) Explain the procedure Rules for developing stock and Strip layouts for progressive dies. 9

   b) Explain the differences between analytical and graphical method to determine the load center. 9

5. a) Explain the methods of preventing spring back error in bending process. 9

   b) Design a combination piercing and bending die for the work piece as shown in the figure 2 below wit HRS 1020. 9

fig-2
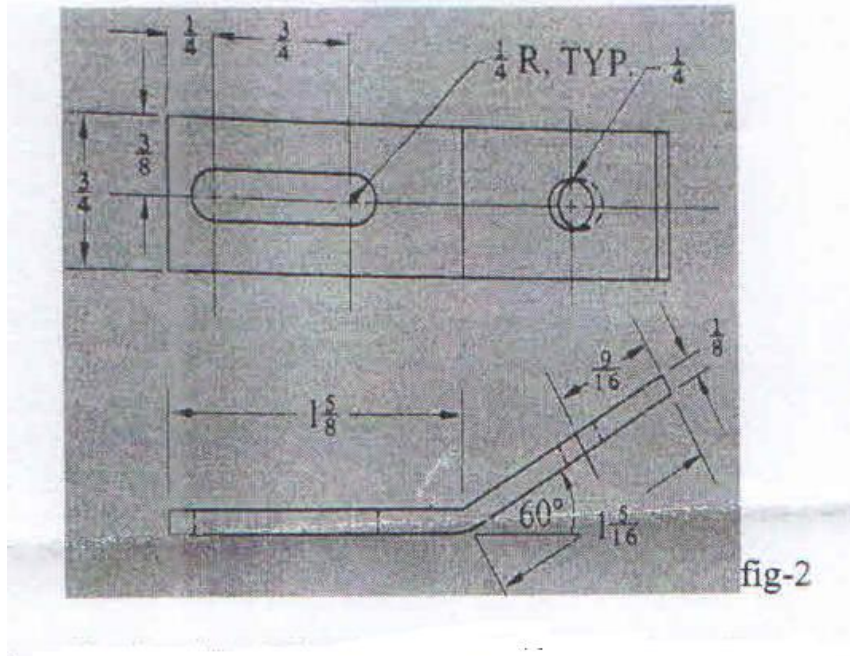
6. a) Sketch various defects in sheet metal Drawing operations. 9

   b) Design a forming die for the Aluminum work piece as shown in the figure 3 below. 9

fig-3
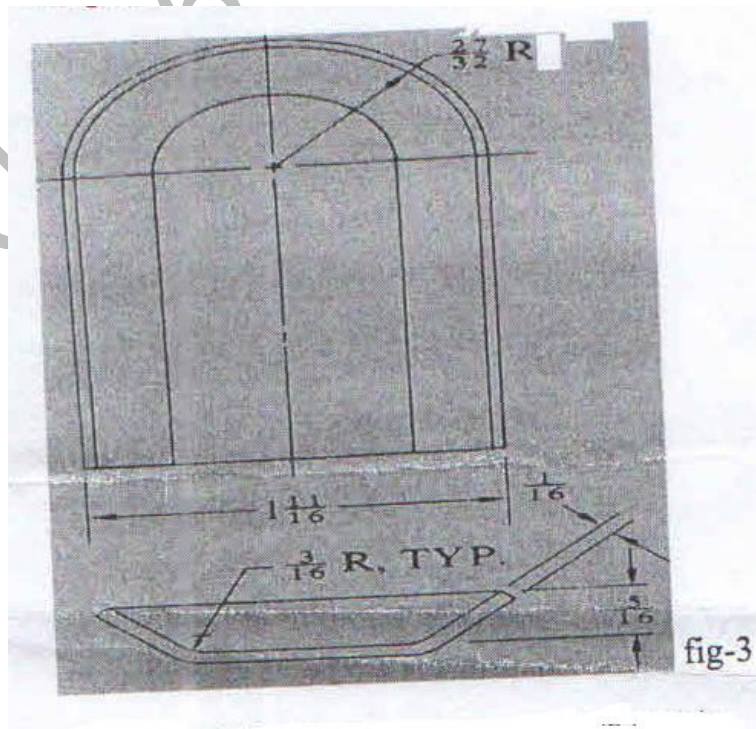
7. a) What are variables affecting drawing operation-explain. 9

   b) Explain the stretch forming process with neat sketch. 9

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FACULTY OF ENIGNEERING
M.E. (Mech.-HVAC) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: Cold Storage Technology and Systems

Time: 2 Hours   Max. Marks: 70

Note: (i) First question is compulsory and answer any three questions from the
          remaining six questions.
     (ii) Answer to each question must be written at one place only and in the same
          order as they occur in the question paper.
    (iii) Missing data, if any, may suitably be assume.

1 Answer any four questions from the following: (4x4=16 Marks)
   (a) Differentiate between sharp freezing and quick freezing.
   (b) Discuss Refrigeration systems for carcass chilling and holding.
   (c) Define Pasteurized Milk Ordinance (PMO).
   (d) What characteristics must be considered for single-story warehouse design?
   (e) How to avoid spoilage during transport through Air circulation?
   (f) Explain the Vacuum Cooling.
   (g) Write short notes on Chilling and Freezing Variety Meats.
   (h) Define juice extraction.

2 (a) What is Air Blast Freezing? Explain the types of Air Blast Freezing methods.   [9]
   (b) Differentiate Forced air cooling and Vacuum Cooling method of re-cooling.   [9]

3 (a) Distinguish Chilled brine spray system and Dry coil systems.   [9]
   (b) How Plate Freezing is done for fishery products? Show the freezing time of fish
       fillets and fish stick in Plate Freezing.   [9]

4 (a) Explain High-temperature short-time (HTST) pasteurization with flow diagram.   [9]
   (b) Classify concentration methods and explain Low Temperature Evaporation
       method for juice concentration.   [9]

5 (a) Determine Factors affecting Building configuration and size of a cold-storage
       facilities.   [9]
   (b) With the help of diagram explain the Total exterior vapor retarder/insulation
       system and Entirely interior vapor retarder/insulation system.   [9]

6 (a) Discuss important design factors for vehicle envelop.   [9]
   (b) With help of sketch explain the Mechanical Railway refrigeration cars.   [9]

7 (a) Enlist the Commercial Freezing Methods with brief introduction.   [9]
   (b) Specifies 3-A Sanitary Standards for silo-type storage tanks?   [9]

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FACULTY OF ENGINEERING

M.Tech (CSE-CSE) II-Semester (AICTE) (Make-up) Examination, July 2021

Subject: Machine Learning and Techniques

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

Note: i) First Question is compulsory and answer any Three questions from the remaining six questions.
   ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
   iii) Missing data, if any may suitably be assumed.

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1. **Answer any Four question from the following**   **(4 x 4 = 16 Marks)**
   a) Define Regression? List out various types of Regression?
   b) What are various issues with SVM?
   c) Define Feature selection and Feature Extraction
   d) What are various types of generative model
   e) List out various classification metrics
   f) What do you mean by k-fold cross validation
   g) Define active learning

2. a) Discuss about K-nearest neighbor algorithm? What are limitation and applications of it?   10

   b) How to build decision tree? What are various limitation and application of decision tree?   8

3. a) Explain K-means algorithm with following example-Assume no. of clusters is three and no. of objects are given as A1 (2,10), A2(2,5), AB(8,4), A4 (5,8), A5(7,5), A6(6,4), A7(1,2), A8(4,9)   9
   b) Why Dimensionality Reduction is required? Explain PCA with stepwise?   9

4. a) Discuss about the Random Forest model in detail? What are the features of Random Forest model?   9
   b) Write about Bagging and Boosting ensemble method   9

5. a) Write short note on feature representation learning   9
   b) Compare ANN, CNN & RNN   9

6. a) What is semi-supervised learning? When can semi-supervised learning works?   8
   b) Discuss about recent trends in various learning techniques of machine learning for IOT applications   10

7 a) What are various applications of deep learning methods?   8
   b) Explain about Reinforcement Learning algorithm?   10

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FACULTY OF ENGINEERING
M.Tech (CSE-CSE) II-Semester (AICTE) (Make-up) Examination, July 2021
Subject: Object Oriented Software Engineering

Time: 2 Hours   Max. Marks: 70

Note: i) First Question is compulsory and answer any Three questions from the remaining six questions.
ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
iii) Missing data, if any may suitably be assumed.

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1. Answer any Four question from the following   **(4 x 4 = 16 Marks)**
   a) Differentiate between specialization and Generalization with appropriate example.
   b) What is the purpose of an Analysis model?
   c) Differentiate between Logical and Physical design
   d) Write a short note on the types of Triggers.
   e) Highlight the importance of Presentation layer.
   f) Explain briefly about persistent mechanisms.
   g) Enlist the Software Maintenance activities

2. a) Discuss in detail about the object Oriented concepts in detail with illustrations   9

   b) Distinguish between models and diagram. Justify your explanation through proper examples.   9

3. a) Explain the Fact Finding Techniques in detail along with their advantages and disadvantages.   8
   b) Apply the concepts and notations to draw a Class Diagram for a Automated Teller Machine case study.   10

4. a) Compare and contrast between system design and detailed design with the object oriented perspective   9
   b) What are subsystems? Explain about the styles of communication between the subsystems.   9

5. a) How do you perform the specification of Attributes and operations? Elaborate with examples.   9
   b) Elaborate the importance of metaphors in Human Computer Interaction.   9

6. a) Explain the concept and notations of a Component Diagram with the help of examples   9
   b) Illustrate and explain the Implementation strategies when introducing a new system into an organization   9

7. a) Explain the notations and develop a Sequence diagram for "Borrow book" activity for a library Management Case study.   9
   b) Discuss in detail about states, events and triggers in state machines with appropriate examples   9

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FACULTY OF ENIGNEERING
M. Tech. (CSE-CSE) (AICTE) II-Semester (Makeup) Examination, July 2021

Subject: Soft Computing and Techniques

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

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may suitably be assume.

1 **Answer any four questions from the following:** **(4x4=16 Marks)**
(a) What is Soft Computing?
(b) Mention the properties of classical sets.
(c) Define a Fuzzy Cartesian product.
(d) List the applications of Artificial Neural Network (ANN).
(e) What is an activation function in Neural Network (NN)?
(f) Define cross over rate.
(g) What are the fuzzy inference methods available in Python / MATLAB tool box?

2 (a) Outline the difference between hard computing and soft computing. 5
(b) Appraise the evoluation of computing. 5
(c) Compare Supervised learning with Unsupervised learning. 8

3 (a) Find fuzzy relation T using Max-Min composition and Max product composition. 9

$$R1 = \begin{bmatrix} 0.2 & 0.5 & 0.7 \\ 0.3 & 0.6 & 0.7 \\ 0.4 & 0.8 & 0.9 \end{bmatrix} \quad R2 = \begin{bmatrix} 1 & 0.8 \\ 0.5 & 0.6 \\ 0.4 & 0.3 \end{bmatrix}$$

(b) Consider the following two fuzzy sets. 9

$$A = \frac{0.2}{1} + \frac{0.3}{2} + \frac{0.4}{3} + \frac{1}{4}$$

$$B = \frac{0.1}{1} + \frac{0.2}{2} + \frac{0.3}{3} + \frac{0.5}{4}$$

Find the Union and intersection of A and B, algebraic sum, algebraic product, bounded sum and bounded difference.

4 (a) Explain Back propagation learning algorithm for feed forward neural network (FFNN). 9
(b) Explain with neat diagram supervised and unsupervised learning in Neural network. 9

5 (a) Examine the steps involved in designing simple Genetic Algorithm (GA) by explaining population of binary strings, fitness function, selection and mutation operators. 9
(b) Classify the types of encoding employed in Genetic Algorithm. 9

6 (a) Write a Python / MATLAB function to compute the max-product composition of two fuzzy relations. 9
(b) What is a Convolutional Neural Network (CNN)? Describe with a diagram about its architecture and typical layer components. 9

..2

7 (a) Find the results of the fuzzy operations as instructed in the following: 8
R = A x B and R = B x A where

$$A = \frac{0.1}{x1}, \frac{0.2}{x3}, \frac{0.5}{x5} \text{ and } B = \frac{0.6}{x2}, \frac{0.8}{x3}, \frac{1.0}{x6}$$

(b) Implement AND and OR function using McCulloch-Pitts neuron (using binary data representation).   10

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FACULTY OF ENIGNEERING

M. Tech. (CSE-CSE) II-Semester (AICTE) (Makeup) Examination, July 2021

Subject: Software Project Management

Time: 2 Hours   Max. Marks: 70

Note: (i) First question is compulsory and answer any three questions from the remaining six questions.

    (ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.

    (iii) Missing data, if any, may suitably be assume.

1 **Answer any four questions from the following:**   **(4x4=16 Marks)**
   a) Explain briefly any two distinct perspectives in improving Software Process.
   b) What are the five staffing principles offered by Boehm?
   c) List the two stages of the Life Cycle phases.
   d) Enlist different Work Flows.
   e) What are the fundamental flaws in Conventional Work Break down structure?
   f) Define Round Trip Engineering.
   g) What are the various stages in Contract Placement?
   h) Explain Programme Management.

2 a) Explain the five basic software parameters of Software Cost Model. [7]
   b) Explain briefly the principles of Modern Software Project Management. [11]

3 a) Explain the Primary Objectives and Essential activities of Life Cycle Phases. [9]
   b) Briefly explain the Life Cycle focus on Artifact Sets. [9]

4 a) Explain different Project Organization, Project-level roles and responsibilities. [9]
   b) Discuss Seven Core Metrics for Project Control and Project Instrumentation with suitable examples. [9]

5 a) Explain any top Seven Software Management Principles of a modern process as viewed by a Software Manager. [9]
   b) Discuss the Next Generation Software Cost Models. [9]

6 a) What are the specific Key Process Areas (KPAs) of the five levels of CMM? How does the performance changes for success levels? [11]
   b) Explain the five distinct processes on ISO12207. [7]

7 Write Short notes on:
   a) Improving Team Effectiveness [7]
   b) Software Change Order Databases [4]
   c) Modern Process Transitions [7]

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FACULTY OF ENGINEERING

M. Tech (CSE-CSE) II-Semester (AICTE) (Make-up) Examination, July 2021

Subject: Network Security

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

Note: i) First Question is compulsory and answer any Three questions from the remaining six questions.

ii) Answers to each question must be written at one place only and in the same order as they occur in the question paper.

iii) Missing data, if any may suitably be assumed.

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1. Answer any Four question from the following   **(4 x 4 = 16 Marks)**

a) What is meant by buffer overflow?

b) Differentiate conventional and public – key cryptosystem

c) Write about digital signature?

d) What is meant by one – way property in hash function?

e) Differentiate TLS and SSL?

f) What is meant by intrusion detection system?

g) Explain about Micro Payments?

2. a) Explain about different types of Attacks?   9
   b) Briefly explain the security services and mechanisms   9

3. a) Describe RSA Algorithm and Estimate the encryption and decryption values for the RSA algorithm parameters   9
   b) Briefly explain the Diffie Hellman Key Exchange algorithm?   9

4. a) Discuss about Secure Hash algorithm?   9
   b) Explain Message Authentication Requirements and what are the attacks related to message communication?   9

5. a) Explain about Zero Knowledge Protocols with examples?   9
   b) Explain types of firewalls in detail with diagram?   9

6. a) Briefly define the principal categories of SET participants?   9
   b) Explain TLS in detail with neat sketch?   9

7. a) Explain in detail about HMAC and Digital Signature Standard   9
   b) Explain about HASH (MD5) Algorithm?   9

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