Code No. 11608

FACULTY OF ENGINEERING

M.E (Civil - SE) III-Semester (Main) (AICTE) Examination, March 2021

Subject : Advanced Steel 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) How the axial force in a column for four column steel tank tower, is obtained when subjected to earth quake load? Explain
b) Under what circumstances a combined grillage footing is provided
c) Give the classification of transmission towers based on fixity circuit system and angle of deviation
d) Discuss the uses of light gauge steel structural members
e) Mention advantages and disadvantages of tubular structure over ordinary structures

2. An elevated rectangular steel water tank, open at top is required to have a capacity of 90,000 litres with a free board of not less than 150mm. The bottom of the tank is at 10m above ground level. Using 1.25m x 1.25m standard pressed steel plates. Design tank, its stays and supporting beam Take design wind pressure as 1.2kN/m^2 Sketch the details. 18

3. a) Two channels with 200mm x 800mm with bent lips are connected with webs to act as a beam. The thickness of the plate is 2.5mm and the depth of lip is 25mm. the beam has an effective span of 4m. Formulate the equations and determine the allowable load on the beam and also find the deflection at the allowable load. The yield stress of steel is 235N/mm^2 and E=2x10^5 N/mm 12
   b) What are the factors influencing the configuration of transmission line towers 6

4. Two column having sections ISHB 450 @ 87.2 kg/m and ISHB 350@ 67.4 kg/m carry axial loads of 3500kN and 1800kN respectively and are placed 3.5 apart. The first and second columns have a base plate of 700mm x 700mm and 600mm x 600mm respectively. Design and detail a combined two tier grillage foundation for columns. Take SBC of soil as 200 kN/m^2. 18

5. Design a hopper portion including stiffeners of a steel square bunker to store 4000kN of coal for a power plant Provide 500mm square hopper opening. The unit weight of coal is 8kN/m^3. The angle of repose of coal is 35^0 / Angle of friction of wall filling is 26^0 and for emptying is 21^0 and pressure ratio are 0.5 and 1.0 respectively 18

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6. Two Channels 220mm x90mm with bent up lips 30mm x 2.5mm are connected with the webs to act as a laterally supported beams of effective span 3m. Determine the allowable load per meter on the beam. Also. Determine the deflection at allowable load Take fy=235 MPa and E=200 GPa. 18

7. a) Derive the expression for sag and tension in a uniformly loaded conductor of a transmission line. Also derive an expression for change in arc length of a uniformly loaded conductor when temperature raises from t_1^oC to t_2^oC 11

   b) Write a brief notes on loads on transmission line tower 7

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Code No. 11607

FACULTY OF ENIGNEERING

M.E. (Civil-SE) III-Semester (AICTE) (Main) Examination, March 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) Define Hydration of Cement.
(b) Define Abrahm's law. Further state the limitations of the same.
(c) What do you mean by Shrinkage of concrete?
(d) State the significance of quality control of concrete.
(e) Classify various types of super plasticizers.

2 (a) What is Alkali-aggregate reaction? What are the factors promoting alkali-aggregate reaction? 9
(b) What is the role of shape, texture and moisture absorption of aggregates on fresh and hardened concrete properties? 9

3 (a) Define workability of concrete. Explain the method of determining workability of very stiff concrete mix. 9
(b) Discuss Maturity Concept of Concrete. Further explain how to predict the compressive streanth of SITE prepared concrete in terms of standard mix. 9

4 (a) How variation in curing methods show impact on performance of concrete. Explain with reference to all curing methods. 9
(b) Discuss the impact of W/C ratio on durability of concrete. 9

5 (a) Explain how absolute volume method play important role in both Indian and American standards while proportioning the aggregates? In what way British standard is different from the above two guidelines? 9
(b) For mild exposure condition design M25 concrete mix based on I.S. Method. Assume suitable data as per standards. 9

6 (a) How do aspect ratio and orientation of fibres influence properties of concrete? Further explain the meaning of fibre concrete. 9
(b) Explain Mix Design and properties of Fly ash Concrete. 9

7 (a) Write a detailed note on air-entraining admixture. 9
(b) Describe factors influencing Creep. Further explain the mechanism of creep of concrete. 9

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Code No. 11602

FACULTY OF ENGINEERING
M.E. (Civil-SE) III Semester AICTE (Main) Examination, March 2021

Subject: Structural Health Monitoring

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 questions from the following (4 x 4 = 16 Marks)

(a) Define structural health monitoring (SHM). Explain their characteristics
(b) Distinguish in brief passive and active SHM.
(c) Explain the basic concept of vibration-based techniques for SHM.
(d) Give classification of fiber-optic sensors used for SHM.
(e) Describe the principle behind application of Piezoelectric sensors as Acoustic Emission (AE) detectors.
(f) Give some of the applications of Low Frequency electromagnetic techniques in SHM.
(g) Why is damage diagnosis in structures called as an inverse problem?

2 (a) Explain in detail the various components of a structural health monitoring system. (10)
(b) Describe the role of smart materials and sensors in SHM process. (8)

3 (a) Distinguish between local and global methods for SHM using vibration based techniques. (10)
(b) Describe the application of vibration based methods in detection of delamination in CFRP plate with stiffeners. (8)

4 (a) What are (a) Intensity based and (b) Phase modulated fiber optic sensors (8)
(b) Describe the applications of Fiber Bragg grating as a strain and temperature sensors. (10)

5 (a) What is piezoelectricity? How is this principle adopted in developing sensors and actuators for SHM applications? (8)
(b) Describe the various methods available in Acoustic Emission technique using piezoelectric sensors for SHM. (10)

6 (a) Explain the fundamental concept behind use of low frequency electromagnetic methods for SHM. (8)
(b) Describe the method of composite and damage monitoring using the electrical resistance method. (10)

7 (a) Write short notes on SHM and Biomimetic. (8)
(b) Write short notes on neural network applications in vibration based damage identification. (10)

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Code No. 11610

FACULTY OF ENGINEERING
M.E. (Civil-TE) III Semester AICTE (Main) Examination, March 2021

Subject: Railway 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.**

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

(a) What analysis is done to access the economic viability of the alignment?
(b) Using a sleeper density of (N+5) determine the number of sleepers required for the construction of a 1500 m BG track.
(c) 'Most of the railway tracks at present are laid with flat footed rails in relation to other types of rail section.' Give reason.
(d) State the circumstances under which Negative super elevation occur in railway track.
(e) What are the functions for formation?
(f) Differentiate between Slide chairs and Grade of chairs.
(g) 'Level crossings are potential accident sites.' Give reasons.

2 (a) List various surveys which are to be conducted for a new railway line an outline the essential objectives. (9)
(b) Explain the uni gauge project in Indian Railways. What are the advantages of uniformity in gauge in Railways? (9)

3 (a) What are the causes of rail failures? Discuss classification of rail failures. (9)
(b) Discuss the necessity and effects of the coning of wheels. (9)

4 (a) Calculate the maximum permissible speed on a curve of a high speed BG group A route having 2° curve, super elevation 60mm, length of transition curve 100m, maximum speed likely to be sanctioned for the section 120 kmph. (12)
(b) What do you understand by equilibrium super elevation? What are its applications? (6)

5 (a) Discuss the quality of an ideal material for formation of a railway track. If the formation soil is black cotton variety, how would you improve it? (9)
(b) State the reasons for renewal of the ballast material used in railway track. (9)

6 (a) What are the various points required to be checked during the inspection of points and crossings? Give the schedule laid down by Indian Railways for the inspection of these points and crossings. (9)
(b) Describe the Mechanical method of interlocking by taking a simple case of a main line and turnout. Support your answer with a sketch. (9)

7 Write short notes on the following. (18)
(a) Centralized traffic control system
(b) Tongue rail
(c) Reverse curve.

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Code No. 11604

FACULTY OF ENGINEERING
M.E. (Civil-CEM) III -Semester (AICTE) (Main) Examination, March 2021

Subject: Industrial Safety

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

Note: i) First Question is compulsory. 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 assumed.

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

a. What do you understand by 'accidents in Industries'?
b. Explain preventive steps for mechanical hazards.
c. Write primary functions of maintenance department.
d. Explain principles of wear.
e. Write sequence of fault finding activities.
f. What do you understand by overhauling of electrical motors?
g. Explain benefits of preventive maintenance.
h. Draw decision tree for problems in hydraulic pumps.

2 (a) Explain the factories Act 1948 for health and safety, washroom, fire and pressure vessels. (9)
(b) How can you estimate plant failure? (9)

3 (a) What are the tools used for maintenance, explain with their application? (9)
(b) Explain fault tracing-concepts and its importance. (9)

4 (a) Write the program and schedule of preventive maintenance of mechanical and electrical equipment. (9)
(b) Explain the working of following types of guards: (9)
(i) Automatic guard (ii) Interlock guard (iii) Trip guard (iv) Positional guard.

5 (a) Explain effect of corrosion on machine components and their prevention. How components can be protected from it. (9)
(b) Describe the role of management, supervisors, workmen, unions and government in industrial safety. (9)

6 (a) What arrangements will you do for relief system? Describe their types and location in the chemical industry. (9)
(b) Discuss workmen's compensation Act (1923). (9)

7 (a) Explain wear and its types, how it effect on working of machines. (9)
(b) Explain fire prevention, fire fighting equipment's and method. (9)

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Code No. 11613

FACULTY OF ENGINEERING
M.E. (EEE-PE) III Semester (AICTE) (Main) Examination, March 2021

Subject: Electric and Hybrid Electrical Vehicles

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

Note i) First Question is compulsory. 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 assumed.

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

(a) What is Aerodynamic drag and what are its causes?
(b) What is a Torque coupler? Draw its neat diagram for multi-gear arrangement.
(c) What do you think are the issues with using fuel cell as an energy source?
(d) Why is a high frequency transformer needed with DC –DC converters?
(e) Draw the instantaneous voltage and current waveforms of a single phase AC-DC bridge converter.
(f) What are PEUKART'S EQUATION and its role in modeling a battery?
(g) What is utility factor and why is it used?

2 (a) What is gear box efficiency and what is its importance? (9)
(b) Discuss the performance parameters of an electric vehicle in detail. (9)

3 (a) Derive the equations for the maximum traction effort for a front wheel. (9)
(b) The speed of a dc motor is controlled by a DC-DC converter. The dc supply voltage is 80V. The armature circuit resistance is Ra=0.3 Ohm and armature inductance is La=8mH. The motor constant Ka=0.07V/rpm. The motor drives a constant torque load requiring an average armature current of 20A. Assuming that the motor current is continuous, compute
(i) The range of speed control (ii) Range of duty cycle. (9)

4 (a) What is insufficient battery charging and what are its effects on the life of the battery? (9)
(b) Bring out the difference between fast charging and quick charging. (9)

5 (a) Give the effect of technical-economical-environmental impact of EVs and HEVs. (9)
(b) What are PHEVs? How are the components of PHEVs sized? (9)

6 (a) Give an account of the different converters used for EVs. (9)
(b) What is insufficient battery charging and what are its effects on the life of the battery? (9)

7 (a) Give the design of Series-Parallel HEV drive train with neat figures. (9)
(b) What do you think are the issues with using fuel cell as an energy source? (9)

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Code No. 11612

FACULTY OF ENGINEERING

M.E (EEE-PES) III-Semester (Main) (AICTE) Examination, March 2021

Subject : Static Control of AC Drives

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 do you mean by rotor resistance control of Induction Motor? Draw its characteristics
b) Draw the output waveforms of stepped and PWM inverters
c) What do you mean by vector control of Induction Motor?
d) Compare self and separate control of synchronous motor
e) List the advantages of stepper motor
f) List the various methods that can be used to control the speed of Induction Motor
g) Compare VSI and CSI fed induction motor drive

2. a) What do you mean by slip power recovery schemes? List the different types of slip power recovery schemes. 6
   b) Explain the principle and operation of static Shcerbius drive in detail 12

3. a) Explain the operation of VSI fed Induction Motor drive for stepped wave and PWM wave inverters 10
   b) Draw the harmonic equivalent circuit of Induction motor and analyze how the performance of induction motor is affected by harmonics 8

4. a) Explain in detail the vector control of induction motor using terminal voltages & induced emf. 12
   b) Explain the terms voltage vector, zero vector, sector, modulation index which are used in space vector PWM 6

4. Explain the operation of VSI fed self-controlled synchronous motor drive with neat circuit and characteristics 18

6. a) Explain the operation of 4 phase 8/6 pole switched reluctance motor under Motoring and braking mode with neat schematic and waveforms 12
   b) Explain the operation of unipolar drive for variable reluctance motor 6

7. a) Explain the operations of CSI fed synchronous motor drive with neat circuit and characteristics 9
   b) Explain the operation of Indirect vector control of Induction Motor drive 9

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Code No: 11635

FACULTY OF ENGINEERING

M.E. (Mech - CAD/CAM) III-Semester (AICTE) (Main) Examination, March 2021

Subject : Failure analysis and 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) Explain product design specifications

b) Define identity? What are the conditions to be satisfied in a theory of invention?

c) Describe different types of fractures in tension

d) What is concurrent engineering and where it is important

e) Explain Axiomatic design

f) Define service failure analysis

g) Write preventive measures for corrosion fatigue

2. a) Explain the product and process life cycle in detail with premarket and market phase? 9
   b) Write short notes on concurrent engineering and Computer aided engineering 9

3. a) Explain steps involved in Embodiment design 9
   b) Explain in detail about Failure mode effect analysis 9

4. a) Explain about energy release rate and stress intensity factor 9
   b) What is Dynamic loading? What is its importance. 9

5. a) Explain fatigue growth binder and mixed mode loading 9
   b) Describe the fatigue crack growth in tension 9

6. a) What are the things to be considered for a good design 9
   b) Explain all steps of Morphology of design 9

7 a) Explain factors influencing fatigue strength 9
   b) Explain facture toughness in welds 9

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Code No. 11632

FACULTY OF ENGINEERING

M.E (Mech – HVAC) III-Semester (AICTE) (Main) Examination, March 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) 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) Explain the manipulator related terms : (a) accuracy ad (b) Repeatability
b) Sketch the various types of joints used in robots
c) What is geometric interpretation of rotation matrix?
d) Compute the homogenous transformation matrix for the following motions: (a)^{R} rotation about z axis by 30^{o} (b) followed by rotation about current y-axis by 60^{o} (c) followed by translation along current x-axis by 5 units.
e) Enumerate any two differences between direct and inverse kinematics
f) Write short note on Hydraulic drive used in robots.
g) Explain the one boundary descriptors in robot vision.

2. a) Discuss different type of end effectors used in robots 11
   b) Compare configurations of spherical coordinate robot and SCARA robot along with their workspace 7

3. Describe DH convention used in kinematic analysis of robot manipulators and derive the expression for the homogenous transformation matrix relating two frames on adjacent links. 18

4. a) Carry out the inverse kinematic analysis of an RP planar manipulator 9
   b) Obtain the relation between end point force and joint torque and force vector 9

5. a) Determine the generalized formulation of Lagrange – Euler formulation of torques of a manipulator with rotary joints. 10
   b) Explain the types of singularities. 8

6. a) Explain the application of the terms related to robotic vision – threshold edge Detection. 9
   b) Draw a sketch and explain the working of proximity sensor. 9

7. a) Explain PD control system with block diagram and compare PID and PD control systems performances. 9
   b) Explain the importance and types of methods available for segmentation of image in image processing. 9

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Code No. 11637

FACULTY OF ENGINEERING

M.E (Mech - HVAC) III-Semester (Main) (AICTE) Examination, March 2021

Subject : Maintenance of HVAC Equipment

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 problems does lubricate oil cause in the evaporator?

b) List the advantages of Air-cooled condenser over water cooled condenser.

c) Define 'Erection'.

d) Write the types of Pads used in foundation?

e) Write some of the main benefits of standards?

f) Explain Total Productive Maintenance?

g) How to perform Halide Torch leak detection?

2. a) Explain the working of centrifugal compressor with neat sketch and determine the field of use in refrigeration and air conditioning giving reasons. 9
   b) Describe the working of Mechanical Colling tower with neat sketch. 9

3. a) Explain different types of Foundations with neat sketch? 9
   b) How to install Air Handling Unit and Explain the working of an AHU? 9

4. a) Explain the factor to be considered for testing an air – cooled condenser. 9
   b) Write the steps to perform mechanical testing of compressors 9

5. a) What is Failure Mode and Effects Analysis and explain DFMEA and PFMEA? 9
   b) Why to perform Failure mode effect analysis? 9

6. a) What are the steps involved in maintenance check of a compressor explain? 9
   b) Explain the step – by-step procedure of charging refrigerant in the system? 9

7. a) What factors are considered in designing a cooling tower? 9
   b) Sketch a Thermostatic expansion valve. Name its different parts and explain How it operates? 9

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Code No: 11623

FACULTY OF ENGINEERING

M.E. (ECE-DS) III-Semester (AICTE) (Main) Examination, March 2021

Subject Advanced Computer Networks

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) List six access technologies. What is the transmission rate of Ethernet LANs.
b) Draw a graph to compare network congestion, moderate congestion and severe congestion.
c) List the services provided by the link layer
d) Describe the User Datagram Protocol
e) Describe the optical switch constructed with directional coupler
f) State the three major functions of mobility management

1. a) What are the five layers in the Internet protocol stack? What are the principal responsibilities of each of these layers? 9
   b) What the two Multiplexing techniques in Circuit-Switched Networks 9

2. a) Describe Binary exponential back off algorithm with an example. 9
   b) Explain Bellman-Ford algorithm with an example and compare with Dijkstra's algorithm. 9

4. a) Explain the fields in a DNS message format. 9
   b) Explain the Connection set up phase and Connection termination phase in a TCP protocol. 9

5. a) Describe the fields in the header of Real – Time Transport Protocol 9
   b) Explain an all-optical router with a wavelength converter. 9

6. a) Explain the Destination-Sequenced Distance Vector (DSDV) routing protocol for Ad-hoc networks. 9
   b) Explain the Communication energy model in wireless sensor networks. 9

7. Write short notes on
   a) Delays in Packet switched networks 7
   b) IP version4 7
   c) File transfer protocol 4

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Code No: 11621

FACULTY OF ENGINEERING

M.E. (ECE-DS) III-Semester (AICTE)(Main) Examination, March 2021

Subject : Wireless Channel Coding 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.

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

a) Explain the need for error control coding in digital communication systems

b) Mention the properties of standard array

c) Define syndrome polynomial. How will you calculate syndrome in cycle codes

d) What are Reed –Solomon codes?

e) Define branch metric, path metric and active path with reference to trellis diagram

f) Explain the hamming code

2 a) What is Galois Field GF (2)? Explain the construction of extension field and hence generate all the field elements of GF (2^3) using the primitive polynomial $p(x) = 1 + x + x^3$ 11

b) Explain the binary fields arithmetic 7

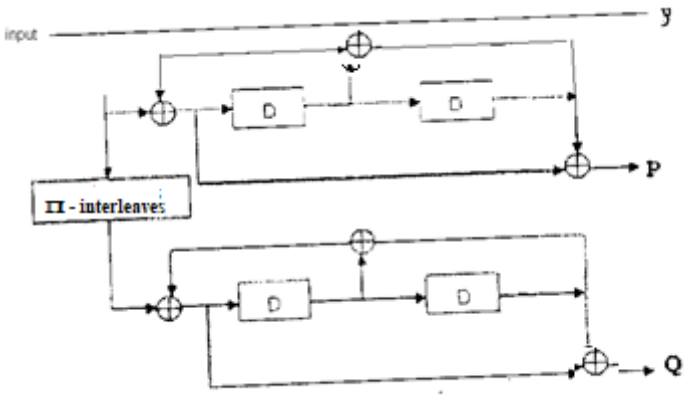
3 a) A (6,3) linear block code has the following parity check digits 11
$C_4 = d_1 + d_2 + d_3$, $C5 = d_1 + d_2$, and $C_6 = d_1 + d_3$
a) Construct the appropriate generator and parity check digits
b) Prepare a suitable decoding table
c) If the received code word is 101100, find the syndrome and indicate on H^T matrix.

b) Explain in detail Read-Muller codes 7

4. a) Explain with neat diagram about the general cyclic code decoder 9
b) Explain Viterbi algorithm for decoding convolutional codes 9

..2

5. a) A turbo encoder is shown below. If the input sequence is 10110110, find the out put of the turbo encoder. Assume a π interleaves as (3 6 5 1 7 4 2 8), 11



b) What are LDPC codes? Describe regular and irregular LDPC codes. 7

6. a) Explain the design of turbo codes 9
b) Explain the tanner graphs for liner block codes 9

7 a) Show that a feed forward convolutional encoder is always linear 8
b) Draw the block diagram of turbo encoder and also explain it in detail 10

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Code No. 11626

FACULTY OF ENGINEERING

M.E (ECE-DS,ES) III-Semester (Main) (AICTE) Examination, March 2021

Subject : Real Time Operating Systems

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 difference between hard and soft real time systems?

b) What is Preemptive & Non Preemptive Scheduling?

c) What does fork and execution indicates in process management in UNIX?

d) Draw the process state diagram.

e) Explain Principle of Concurrency

f) How are semaphores addressed in μ Cos?

g) Write any two main aspects of choosing RTOS for an electronic system design

2. a) Briefly explain the functions of RTOS. 9
   b) Explain Basic features of Vx-works. 9

3. a) Write the usage of RT Linux and μ cos-II 9
   b) Write a short note on UNIX Multilevel Feedback Scheduling 9

4. a) Explain about task states, state transitions, task creation, activation and deletion in Vx Works 11
   b) Explain about POSIX Standards. 7

5. a) Write a note on process management in UNIX OS and elaborate on forks and execution. 10
   b) Explain any three commercial RTOS and differentiate between them taking suitable examples. 8

6. a) Briefly explain about inter process communication through semaphores and mutex. 9
   b) Explain the term Context scheduling with illustrations. 9

..2

7. a) For the process set given below Table what is the CPU utilization? Is it shedulable?
   Draw the GANTT chart for the given tasks using RMS Uniprocessor Scheduling. 9

Process	Execution Time (in ms)	Time Period (in ms)
P1	3	20
P2	2	5
P3	2	10

   b) What are different Debugging tools and Cross Development Environment for RTOS 9

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Code No. 11617

FACULTY OF ENGINEERING

M.E (ECE- ES & VLSI / ES & VLSI DESIGN) III-Semester (AICTE) (Main) Examination,

March 2021

Subject : Advanced Digital Design with Verilog HDL

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) Write verilog code for full adder using logic operators

b) Design BCD –to-seven segment decoder in behavioral modeling

c) Describe the operations of the Espresso algorithm

d) Define design models of functional verification

e) What are the two mostly used bus arbitration schemes?

2. a) Explain hierarchical structural modeling with example. 9
   b) Design CMOS two input NOR gate in switch level modeling 9

3. a) Realize n-bit 1:4 Demultiplexer using case statement 9
   b) Design 3 bit ripple carry counter with asynchronous reset 9

4. a) Describe restructuring operations in logic synthesis 9
   b) Obtain kernel and co-kernel for the following function 9
   F(T, U, V, W, X, Y, Z) = TWY + TXY + UWY + UXY + VWY + VXY + Z

5. a) Explain types of self checking checkers with the help of neat diagram 9
   b) Design and verify a 4 to 2 priority encoder using case statement and indicate the expected simulation output. 9

6. a) Design and verify a 4-bit CLA adder using assign statements 9
   b) Explain operation of the sequential implementation of the shift and add multiplication with example. 9

7. a) Explain the general architecture of an HDL Simulator 9
   b) Explain design environment and constraints used in synthesis. 9

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Code No. 11619

FACULTY OF ENGINEERING

M.E (ECE - ES,ES & VLSI / ES & VLSI DESIGN) III-Semester (Main) (AICTE) Examination,

March 2021

Subject : SOC 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) Explain the benefits and drawbacks of Software and Hardware implementation

b) Differentiate VLIW processors from Superscalar processors.

c) Explain the nibble mode and page mode in DRAM

d) What is the function of bus arbitration?

e) What is Electronic System Level design and verification?

f) Define Soft processor and mention any four soft processors

g) Compare the features of flash memories

2. With a neat flow chart explain the process of processor core selection and also explain the tradeoffs during the process 18

3. a) Explain various hazards in pipelining 8
   b) Explain the pipeline delay minimizing techniques 10

4. Explain different line / block replacement techniques in Cache memory 18

5. Explain about SOC standard buses 18

6. Explain the process of designing 3-D Graphic Processor 18

7. a) What is out of order execution 10
   b) Compare the configuration parameters of some DRAM chips. 8

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Code No. 11645

FACULTY OF ENGINEERING

M.Tech (CSE-CSE) III-Semester (AICTE) (Main)Examination, March 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) 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) Enlist the five most important principles of modern software management?

b) Explain the concept of iterative process planning?

c) What is process improvement? Why is it needed?

d) What are the specific artifacts of the Design Set?

e) What are the various levels of CMM?

f) How are dependency diagrams useful in program management?

g) Enlist the basic characteristics of a good metric?

2. a) What are the different processes are required for improving software processes? 9
   b) How to improve the team effectiveness explain in detail? 9

3. a) What are the default roles in a software line-of-business organizations explain with a diagram? 12
   b) What is the process of evolutionary work breakdown structures? 6

4. a) What are the responsibilities of software management team explain in detail? 9
   b) Illustrate how the team's center of gravity shifts over the life cycle? 9

5. a) Explain the process of artifact evaluation over the life cycle? 9
   b) Explain the primary objectives, essential activities and evaluation criteria of construction phase? 9

6. a) Write short notes on "Distinct Process in ISO-12207? 7
   b) What are the problems with conventional WBS and how they are resolved in evolutionary WBS? 11

7. a) List the seven core metrics and describe the purpose of each metric? 7
   b) What are the different models of motivation that have been proposed to motivate team members to work effectively? 7
   c) Differentiate between major and minor milestones? 4

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Code No: 11643

FACULTY OF ENGINEERING

M.Tech (CSE-CSE)III-Semester (AICTE) (Main) Examination, March 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) Answers to each question must be written at one place only and in the same order as they occur in the question paper.
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1. Answer any Four question from the following (4 x 4 = 16 Marks)

a) Give the definition of the convex fuzzy set and a normal fuzzy set.

b) Explain the centroidal approach for the defuzzification of a fuzzy set?

c) What is the difference between pretrained and non-pretrained CNN models?

d) What are the two important features of evolution?

e) What do you understand by the concept of “fitness landscapc” in GA

f) Give the names of incoming and outgoing signals of a biological neuron?

g) Explain the concept of resonance in neural networks?

h) Why are computations using tensor flow very fast?

1. a) Give the Hamacher T-norm $T_H(a,b,\lambda) = \frac{ab}{[\lambda + (I-\lambda)(a+b-ab)]}$ find the corresponding S-norm, $S_H(a, b, \lambda)$ using De Morgan’s law 10

b) Give the block diagram of an expert system. 8

2. a) The Rule is : *x is A then y is B.* Fact is : *x1 is A1*, then what is the consequent : y1 *is B1*? Here road (x) is Narrow (A) = {0.3/L, 0.5M, 0.7/S} where L = Large, M=Medium and S=Small and road (y) is Risky (B) = {0.9/H, 0.7M, 0.6/L} where H = High, M=Moderate and L=Low. Given that MG road (x1) is Narrow (A1) = {0.2/L, 0.4/M, 0.8/S}; what is the fuzzy set, MG road (y1) is Risky (B1)? 12

b) How is the convergence improved in multilayer perceptron model 6

4. a) Define the terms chromosomes, fitness function, crossover and mutation as used in Genetic Algorithms 9

b) Given the two chromosomes (101011001010) and (110011010101), use one – point crossover and then mutate 7th bit of each child chromosome based on its even-parity. 9

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5. a) A competitive neural network net with two clusters and one 3-input unit. The weight vectors for the cluster units are: (0.8, 0.6, 0.5) and (0.3, 0.2, 0.4). Find the winning cluster unit using the square of the Euclidean distance for the input vector (0.4, 0.2, 0.1). Assume the learning rate of 0.2 and find the new weights for the winning unit. 10

   b) Describe in detail the architecture of Radial Basis Function Network (RBFN). 8

6. a) Learn the AND function using the perceptron model for two iterations given the initial weights as $W_0 = -0.05$, $W_1 = -0.02$, $W_2 = 0.02$. Take the learing factor as 0.5. 10

   b) What is difference between supervised learning and reinforced learning? Explain how the jackpot journey problem solved with reinforced learning 8

7 a) Find the root node by using Gini index for the following training set 10

Day	**Humidity**	**Wind**	**Play Tennis**
D1	High	Weak	No
D2	High	Strong	No
D3	High	Weak	Yes
D4	High	Weak	Yes
D5	Normal	Weak	Yes
D6	Normal	Strong	No
D7	Normal	Strong	Yes

   b) What are the features of Python? How are the lists processed in Python? 8

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Code No. 11641

FACULTY OF ENGINEERING

M.Tech (CSE-CSE) III-Semester (AICTE) (Main) Examination, March 2021

Subject : Data Science

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

a) What is Data Wrangling Process?

b) What is Data Transformation?

c) Differentiate between uni –variate and bi-variate analysis

d) What is Kernel in SVM? What are the different kernels in SVM?

e) What is Systematic Sampling?

f) In a survey conducted, the average height was 164cm with a standard deviation of 15cm. If Alex had a z-score of 1.30, what will be his height?

g) What is Data imputation?

2. a) What is the difference between business intelligence and data Science? 5
   b) What are the different type of data in Data Science. Explain in detail about data formats with suitable examples 8
   c) What are the main components of data science? 5

3. a) What is NoSQL? List out the features of NoSQL? Explain types of NoSQL databases in brief 9
   b) What is outlier? What are the types of Outliers? What causes Outliers? 9

4. a) Suppose that a hospital tested the age and body fat data for 18 randomly Create selected adults. Develop the following results. 10

Age	23	23	27	27	39	41	47	49	50
%Fat	9.5	26.5	7.8	17.8	31.4	25.9	27.4	27.2	31.2
Age	52	54	54	56	57	58	58	60	61
%Fat	34.6	42.5	28.8	33.4	30.2	34.1	32.9	41.2	35.7

Calculate the mean, median, standard deviation and variance of age and %fat

   b) Use the min-max normalization by setting min=0 and max=1 to normalize the following group of data. The attributes salary (Sal) and Year of experience (Exp) 8

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Sal	100000	23000	27000	92000	39000	44000	47000	66750	50500
Exp	10	7	12	7	6	8	2	9	15

5. a) What do you understand by Data Visualization? Discuss some python's data visualization tools such as Box plots, scatter plot, histogram count plot in brief. 9
   b) What Binary Encoding? Explain one-hot and binary encoding with help of following data? 9

Temp	Hot	Cold	V.Hot	Warm	Hot	Warm	Warm	Hot	Cold
Color	Red	Blur	Yellow	Blue	Blue	Green	Red	Blue	Blue
Target	1	1	1	0	0	1	0	1	0

6. a) Explain primary data collection methods in Data Science? 9
   b) What are the different stages in a Data Science Project. Explain each stage? 9

7. a) What are the different ways of cleaning data. Explain? 9
   b) Give the following data for the sales (in million dollars) of Car of an Auto-mobile Company for 6 Consecutive year. 9

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

Based on the above data, predict the sales for next three consecutive years?

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Code No: 11647

FACULTY OF ENGINEERING

M.Tech (CSE-CSE) III-Semester (AICTE) (Main)Examination, March 2021

Subject : Mobile Computing

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) How are guard spaces realized between users in CDMA?

b) What is Polling in MAC

c) What are the problems associated with handover in GSM

d) Draw the Physical frame format for FHSS

e) Mention the attacks that affect MANET

f) Why a scripting language been added to WML?

g) How does it save bandwidth and reduce delay

2.	a)	Explain TDMA and various techniques of access	10
	b)	Describe cellular systems	8
3	a)	What is handover? Why it is required? What are the handover scenarios in GSM?	9
	b)	Differentiate DAM and DVB	9
4.		Discuss the system architecture of IEEE 802. 11a and 802.11b	18
5.	a)	Explain reverse tunneling in mobile IP	8
	b)	Discuss the Global State Routing and Fish-eye state Routing	10
6.	a)	Explain Push-based Mechanisms. What are its advantages and disadvantages	9
	b)	What is Data Dissemination. Explain one method of Data Dissemination	9
7	a)	Draw the protocol stack of Bluetooth with description	9
	b)	Discuss WAP Architecture	9

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