Subject Code: R16CC42OE4

IV B.Tech II Semester Regular Examinations, September-2020
NON-CONVENTIONAL ENERGY RESOURCES (OPEN ELECTIVE-III)
(CSE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What is solar radiation?
   (b) Write the applications of solar ponds
   (c) What are the Components of WECS
   (d) What is the principle of tidal power?
   (e) Write different thermoelectric materials

   (f) Write the advantages of MHD system.

                                                                                              [2+2+2+2+2+2]

PART-B

                                                                                              4 X 12 = 48

2. (a) Explain the solar radiation at earth's surface. [8M]
   (b) Explain how the solar radiation is measured and data is obtained.[4M]

3. Write about photovoltaic energy conversion process with neat diagram.[12M]

4. (a) Briefly explain about vertical axis wind turbines.
   (b) Discuss advantages and disadvantages of wind energy and write site selection factors. [6+6]

5. (a) What are the different types of geothermal resources?   [7M]
   (b) Write advantages and disadvantages of tidal power .[5M]

6. (a) Explain Thermo electric power generation system with neat diagram [8M]
   (b)Write short note on Peltier and Thomson effects   [4M]

7. (a) Explain the principle of MHD Power generation   [6M]
   (b) Describe the Open cycle and Closed cycle MHD Systems   [6M]

                                                ***

Subject Code: R16CC42OE5

IV B.Tech II Semester Regular Examinations, September-2020
INTRODUCTION TO EMBEDDED SYSTEMS (OPEN ELECTIVE-III)
(EEE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Mention the special characteristics of an embedded system.
   (b) What is memory shading?
   (c) Explain the importance of real time clock.
   (d) What is portability? How do you measure it?
   (e) List out the types of RTOS.
   (f) What is the difference between simulator and emulator?

   [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) What is an embedded system? Classify it based on complexity and performance. [6]
   (b) What are the limitations in accessing memory? Explain the purpose of embedded
   system in data collection. [6]

3. (a) Mention the differences between Harvard and Von-Neumann architectures. [5]
   (b) Explain the operation of data storage in memory location with the help of
   endianness. [7]

4. (a) List out the components of an embedded firmware. [4]
   (b) Explain I2C, SPI communication protocols. [8]

5. (a) Explain the characteristics of an embedded system. [5]
   (b) Clearly explain the operational attributes of an embedded system. [7]

6. (a) What is a process, semaphore and thread? Explain the life cycle of a process. [7]
   (b) What is RTOS? How one can choose RTOS? [5]

7. (a) What is debugging? Explain the debugging of an embedded software. [6]
   (b) Explain the stages of compiler. [6]

***

Subject Code: R16CE4201

IV B.Tech II Semester Regular Examinations, September-2020
BUSINESS MANAGEMENT CONCEPTS FOR ENGINEERS
(CE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define Law of Demand
   (b) What is margin of safety?
   (c) List out accounting conventions.
   (d) List any Five Challenges of Management
   (e) Write difference between production and productivity.
   (f) Define financial management

                                                                                      [2+2+2+2+2+2]

PART-B

                                                                                      4 X 12 = 48

2. (a) What is the need for demand forecasting in the present business environment?
   (b) Illustrate how the demand forecasting techniques are supporting managers in taking managerial decisions

3. (a) Illustrate CVP analysis
   (b) list any four differences between monopoly and monopolistic markets.

4. (a) what is double entry system? Explain the merits and demerits of double entry system.
   (b) write journal entries for the following transactions.

Date	Transaction	Amount
01-03-2019	Ram started business with	Rs 5,00,000/-
02-03-2019	Deposited cash in bank	Rs2,00,000/-
03-03-2019	Furniture purchased from Krishna for	Rs 1,00,000/-
04-03-2019	Paid cash 75,000/- in full settlement of his account	

5. (a) Explain the 14 Principles of Henry Fayol.
   (b) List out the functions of Marketing.

6. (a) Explain ABC analysis with example

    (b) list any four difference between Job, Batch & Mass Production.

7. (a) The activities along with their dependency relationships are given below. Draw the Network diagram.

Activity	A	B	C	D	E	F	G	H	I	J
Immediate Predecessor	-	-	-	A	A,B	B,C	C	E,F	G,H	H

    (b) list any three difference between PERT and CPM

Subject Code: R16CE4202

IV B.Tech II Semester Regular Examinations, September-2020
PRE-STRESSED CONCRETE STRUCTURES
(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of Part-A and Part-B.
Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A
[2+2+2+2+2+2]

1. (a) List two advantages and disadvantages of Pre-stressed Concrete.
   (b) Define pre-tensioning and post-tensioning.
   (c) What are the losses present in pre-tensioned members?
   (d) List the different types of flexural failure modes observed in PSC beams.
   (e) What is concordant cable profile?
   (f) State the methods available to calculate anchorage zone stresses.

PART-B
4 X 12 = 48

2. (a) Explain the development of prestressed concrete.
   (b) Enumerate the characteristics of high strength concrete and high strength steel.

3. Describe the different methods of pre-tensioning and post-tensioning.

4. (a) Explain the losses of pre-stress due to post-tensioning.
   (b) A pre-tensioned concrete beam 100 mm wide and 300 mm deep is prestressed by straight wires carrying an intial force of 150 kN at an eccentricity of 50 mm. The modulus of elasticity of steel and concrete are 210 and 35 kN/mm². Estimate the percentage of loss of stress in steel due to elastic deformation of concrete. If the area of steel wires is 188 mm².

5. (a) Explain conventional failure of an over reinforced prestressed concrete beam.
   (b) A post-tensioned bridge girder with unbonded tendons is of box section of overall dimensions 1200 mm wide by 1800 mm deep with wall thickness of 150 mm. The high tensile steel has an area of 400 mm² and is located at an effective depth of 1600 mm. The effective pre-stress in steel after all losses is 1000 N/mm² and effective span of the girder is 24 m. If f_{ck} = 40 N/mm² and f_p = 1600 N/mm². Estimate the ultimate flexural strength of the section.

6. A post-tensioned bonded prestressed concrete beam of rectangular cross section 400 mm wide by 550 mm deep is subjected to a service load BM of 166.6 kNm. Torisonal moment of 46.6 kNm and shear force of 66.6 kN. The section has an effective prestressing force determined from service load requirements of magnitude 500 kN at an eccentricity of 150 mm provided by 5 nos. of 12.5 mm strands of cross-sectional area 506 mm² with an ultimate tensile strength of 1820 N/ mm². If f_{ck} is 40 N/mm², design suitable longitudinal and transverse reinforcements in the beam using IS: 1343 code based on skew bending approach.

7. (a) What are the factors influencing deflections?
   (b) The end block of post tensioned prestressed concrete beam 300 mm wide, 300 mm deep is subjected to a concentric anchoring force of 832800 N by a fressinet anchorage of area 11720 mm². Design and detail the anchorage reinforcement for the end block.

Subject Code: R16CE4212

IV B.Tech II Semester Regular Examinations, September-2020
GEOGRAPHIC INFORMATION SYSTEM
(CE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Write GIS components
   (b) What is Data input
   (c) What is DEM?
   (d) Briefly explain buffering analysis
   (e) Define GIS
   (f) Write the tools for map analysis

                                                                 [2+2+2+2+2+2]

PART-B

                                                                 4 X 12 = 48

2. (a) Give the details of the important map projections.

   (b) Give the details of vector data structure and mention its merits and demerits.

3. (a) Explain the importance of overlaying index methods in GIS.
   (b) Explain about the correction and storage data output

4. (a) Explain the need of DEMs
   (b) Discuss about the data sources and sampling methods for DEMs

5. (a) What is network analysis? Explain its uses.
   (b) What is vector overlay operation? Explain

6. (a) Explain the advantages and disadvantages of cartographic modeling in land evaluation
   and planning
   (b) Classify data in GIS context and explain spatial data editing

7. (a) Write on a)Boolean logic models b) Index overlay models
   (b) Discuss overlay using a decision table.

Subject Code: R16EE4201

IV B.Tech II Semester Regular Examinations, September-2020
SOFT COMPUTING TECHNIQUES TO ELECTRICAL ENGINEERING
(EEE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Describe the characteristics of artificial neural networks
   (b) What is back propagation learning method?
   (c) List the properties of fuzzy sets.
   (d) Define fuzzification & defuzzification
   (e) What are the important aspects of using Genetic Algorithms?
   (f) Which soft computing method is best suitable to solve unit commitment problem? Justify.

   [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) With the help of a neat diagram, explain the analogy of a biological neuron. **[6 M]**
   (b) Define artificial intelligence. Explain the techniques of AI. Describe the characteristics of AI **[6 M]**

3. (a) Draw the architecture of multilayer perceptron and explain the training algorithm along with expressions. **[6 M]**
   (b) What are the limitations of back propagation algorithm? **[6 M]**

4. (a) Explain relations between fuzzy and crisp sets and also its conversion **[6 M]**
   (b) Explain in detail about fuzzy membership functions and features. **[6 M]**

5. (a) List the various defuzzification techniques. Explain any two of them in detail **[6 M]**
   (b) Distinguish between Crisp logic and Fuzzy logic. **[6 M]**

6. What is meant by genetic algorithm? Draw a neat flowchart and explain the operation of a simple genetic algorithm. **[12 M]**

7. Explain how GA can be applied for reactive power control in power systems **[12 M]**

***

Subject Code: R16EE4202

IV B.Tech II Semester Regular Examinations, September-2020
FLEXIBLE AC TRANSMISSION SYSTEMS
(EEE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of Part-A and Part-B.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) List out the benefits from FACTS controllers.
   (b) Highlight the difference between Current source converters and Voltage source converters.
   (c) What are the methods to improve the transient stability?
   (d) Enumerate the methods of controllable VAR generation.
   (e) What are the uses of static series compensators?
   (f) Give the application of combined controllers on transmission lines.

   [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Illustrate the power flow in parallel paths of AC system. (6M)

   (b) Discuss about the importance of controllable parameter. (6M)

3. (a) Explain the operation of three phase full-wave bridge converter with a neat circuit diagram and necessary waveforms. (12M)

4. a) Explain the mid-point voltage regulation for line segment by using shunt compensation. (6M)

   b) Discuss about Power oscillation damping. (6M)

5. a) Explain the operating features of Thyristor Switched Capacitor with a neat sketch. (6M)

   b) Explain V-I characteristic of static VAR compensator. (6M)

6. a) Describe the configuration and characteristics of basic Thyristor-Switched Series Capacitor. (12M)

7. a) Explain the basic operating principles of unified power flow controller. (12M)

******

Subject Code: R16ME4201

IV B.Tech II Semester Regular Examinations, September-2020
MECHATRONICS
(ME)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What is a Rotational Mechanical System?
   (b) Differentiate between a Sensor and a Transducer
   (c) Discuss about Piezoelectric actuators.
   (d) Differentiate NAND gate and NOR gate.
   (e) Explain Artificial Intelligence in mechatronics.
   (f) Explain steady state response.

                                                                              [2+2+2+2+2+2]

PART-B

                                                                              4 X 12 = 48

2. (a) What are the components of Mechatronic system? Explain their significance in modelling.
   b) Explain about any two types of Transducers in detail.

3. (a) What is the principle of Transduction? Differentiate between inductive and capacitive transducers.
   (b) Discuss about thermo couple and thermistors.

4. (a) Explain any two types of Mechanical actuation system.
   (b) Explain about fluid power actuators.

5. (a) What is a number system? Explain in detail about types of number systems.
   (b) What are the applications of logic gates?

6. What are the applications of Mechatronics in condition monitoring and micro sensors?

7. What is PLC? Explain the basic structure of PLC with an example.

***

Subject Code: R16ME4202

IV B.Tech II Semester Regular Examinations, September-2020
REFRIGERATION & AIR CONDITIONING
(ME)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

[2+2+2+2+2+2]

1. a) Explain the necessity of refrigeration.
    b) Draw a neat labelled symmetric diagram of a simple vapour compression refrigeration system?
    c) State the working principle of air cooled and water cooled condensers.
    d) State the function of absorber in vapour absorption system.
    e) What are the requirements of industrial air conditioning?
    f) What are air conditioning system components?

PART–B

4 X 12 = 48

2. a) Describe with a diagram the reduced ambient air cooling system.
    b) A regenerative air cooling system is used for an air plane to take 30 tonnes of refrigeration load. The ambient air at pressure 0.8 bar and temperature 10^0C is rammed isentropically till the pressure rises to 1.2 bar. The air bled off the main compressor at 4.5 bar is cooled by the ram air in the heat exchanger whose effectiveness is 60%. The air from the heat exchanger is further cooled to 60^0C in the regenerative heat exchanger with a portion of the air bled after expansion in the cooling turbine. The cabin is to be maintained at a temperature of 25^0C and a pressure of 1 bar. If the isentropic efficiencies of the compressor and turbine are 90% and 80% respectively, find: (i) Mass of the air bled from cooling turbine to be used for regenerative cooling (ii) Power required for maintaining the cabin at the required condition and (iii) COP of the system. Assume the temperature of air leaving to atmosphere from the regenerative heat exchanger as 100^0C.

3. a) Explain with reference to T-s diagram, the stages involved in vapour compression process of refrigeration.
    b) A vapour compression works on a simple saturation cycle with R-12 as the refrigerant which operates between the condenser temperature of 40^0C and an evaporator temperature of -5^0C. For the modified cycle, the evaporator temperature is changed to -10^0C and other operating conditions are the same as the original cycle. Compare the power requirement for both cycles. Both system develops 15 tonnes of refrigeration.

4. a) Differentiate between physical and thermodynamic properties of a refrigerant. Explain which are more important giving specific examples.
    b) Describe with neat sketches, the working of shell & tube and flooded type condensers.

5. a) In a vapour absorption system, heat is supplied to the generator at a temperature of 90°C. The cooling in condenser and refrigeration evaporator takes place at 20°C and 10°C respectively. Find the maximum COP of the system.

   b) What are the advantages and disadvantages of steam jet refrigeration system over other types of refrigeration system?

6. a) Sensible and latent loads on a space are 50 kW and 10 kW respectively. Cold and dehumidified air at 10°C DBT and 90% RH is used to maintain the space condition at 24°C DBT. Find (i) RSHF (ii) space relative humidity and (iii) mass flow rate of supply air?

   b) Explain the difference between winter and summer air conditioning systems.

7. a) Explain the use of heat pump for heating and cooling cycle with a neat diagram?

   b) With neat sketch explain construction and working of any one type of humidifier.

***

Subject Code: R16ME4206

IV B.Tech II Semester Regular Examinations, September-2020
ALTERNATE SOURCES OF ENERGY
(ME)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1.
a) Define Altitude angle.
b) List out the main components of a flat plate solar collector?
c) Classify Solar energy storage systems.
d) What is the basic principle of wind energy conservation system?
e) How the biogas is used in IC engines.
f) What are the environmental issues from Geothermal plant?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2.
a) What are the difference between pyrheliometer and pyranometer? (4M)

b) Describe the principle of Angstrom pyrheliometer. (8M)

3.
a) What are the advantages and disadvantages of concentrating collectors over flat plate collectors? (7M)

b) Describe control power receiver collector. (5M)

4.
a) With a neat sketch, explain the working of a solar pond electric power plant. (6M)

b) With a neat schematic diagram, explain working technique of solar heating and cooling. (6M)

5.
a) Using Betz model of a wind turbine, derive the expression for power extracted from wind. (6M)

b) Explain about vertical axis wind mills with neat diagram (6M)

6.
a) Write short notes on aerobic digestion. (6M)

b) With a neat schematic diagram, explain fixed dome type of biogas plant. (6M)

7. Explain with neat sketches, the operation of geothermal plant. (12M)

***

Subject Code: R16EC4201

IV B.Tech II Semester Regular Examinations, September-2020
CELLULAR AND MOBILE COMMUNICATIONS
(ECE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Explain about fading and crosstalk.
   (b) Write a short note on frequency management.
   (c) What is handoff and list the types of handoff.
   (d) Briefly explain about co-channel interference.
   (e) What is the minimum separation of cell site antennas?
   (f) Write a short note on the TDMA architecture.

                                                                          [2+2+2+2+2+2]

PART-B

                                                                          4 X 12 = 48

2. (a) Explain advantages and disadvantages of various cellular systems.   [6 M]
   (b) Explain basic cellular mobile system? Describe the various generations of wireless mobile communication?   [6 M]

3. (a) Explain different types of non co-channel interference in a cellular system?   [6 M]
   (b) Explain the effects of antenna design parameters for the interference in a cellular system.   [6 M]

4. (a) Explain the space diversity antennas and umbrella pattern antennas?   [6 M]
   (b) Explain the importance of high gain antennas?   [6 M]

5. (a) Explain about channel sharing and borrowing?   [6 M]
   (b) Explain different channel assignment methods and their importance in cellular systems?   [6 M]

6. (a) Describe the different methods of delaying handoff.   [6 M]
   (b) What is meant by a dropped call? How can the call drop rate be improved?   [6 M]

7. (a) Explain GSM network architecture with the corresponding diagrams.   [6 M]
   (b) Explain the principle, advantages and disadvantages of CDMA technique.   [6 M]

***

Subject Code: R16EC4203

IV B.Tech II Semester Regular Examinations, September-2020
WIRELESS SENSOR NETWORKS
(ECE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Differentiate between cellular and adhoc wireless networks.
(b) What is Personal Area Networking?.
(c) List four categories of Multicast routing protocols.
(d) Write a short note on Source Tree Adaptive Routing protocol.
(e) Why does TCP not perform well in ad hoc wireless networks?
(f) What are smart metering applications?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain in detail about applications of sensor networks.   [6]
   (b) Discuss about the issues and challenges in designing a sensor network.   [6]

3. Describe TinyOS with details of "Field Monitor" application and Timer component Interfacing.[12]

4. (a) Explain design goals of a MAC protocol for Ad Hoc wireless networks.   [6]
   (b) Describe the contention based MAC protocols with scheduling mechanisms.   [6]

5. (a) Explain in detail about proactive routing approaches.   [6]
   (b) Illustrate the issues which give impact on designing a routing protocol for Ad Hoc wireless [6]
       networks.

6. (a) Explain about design goals of a transport layer protocol for ad hoc wireless networks.   [6]
   (b) How can application controlled and Ad Hoc transport protocols useful for Ad Hoc wireless
       Networks? Explain.   [6]

7. (a) Write a short note on Transport layer Attacks and Application Layer Attacks.
   (b) Discuss on key management in Ad Hoc Wireless Networks.
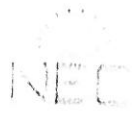
***

Subject Code: R16EC4211

IV B.Tech II Semester Regular Examinations, September-2020
EMBEDDED SYSTEM DESIGN
(ECE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What is market window?
   (b) Write a simple algorithm for finding the GCD of two integer numbers.
   (c) State the difference between Princeton and Harvard architecture.
   (d) What is handshake protocol?
   (e) Compare the state machine and sequential program models.
   (f) What is State Machine model?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) List and define the processor technologies. What are the benefits of using each of the different processor technologies? [6]
   (b) The Design of a particular disk drive has an NRE cost of $1000,000 and a unit cost of $20. How much will we have to add to the cost of each product to cover our NRE cost assuming we sell: [6]
      i. 100 units
      ii. 10,000units

3. (a) What is a single purpose processor? What are the benefits of choosing a custom single purpose processor? [4]
   (b) Distinguish between combinational and sequential logic circuits. [4]
   (c) What are the Data path steps involved in designing a custom single-purpose processor that executes the GCD program? [4]

4. (a) Illustrate how program and data memory fetches can be overlapped in a Harvard architecture. [5]
   (b) Discuss about the following with an example [7]
      i. Pipelining   ii. Interrupts

5. What is memory hierarchy? How does cache operate? Discuss the cache mapping technique. List its merits and demerits. [12]

6. (a) Explain about concurrent process model in detail. [6]
   (b) Explain about Hierarchical state machines with elevator's Unit Control. [6]

7. (a) What is Hardware/Software co-simulation? What is the key method for speed up such simulation? [6]
   (b) Draw the transistor level circuit schematic for a two input multiplexer. [6]

Subject Code: R16CS4203

IV B.Tech II Semester Regular Examinations, September-2020
SOFTWARE QUALITY ASSURANCE AND TESTING
(CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What is a quality metric? Give any two examples to quality metrics.
(b) Is testing mandatory for software. Justify your answer.
(c) Explain black box testing scenario.
(d) Define software testing automation.
(e) Give the differences between verification and validation.
(f)Define test case explain with an example.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. Explain about different software quality models.

3. (a)How a management give a support for software testing.
(b) Write the policy followed for software testing.

4. Explain the following
(a) Process preparation check list (b) Static testing   (c) Validation activities

5. What is software test automation? List and discuss the major objectives of software test automation.

6. Define software testing process. What are the parameters used for developing a test plan. Give an example.

7. (a)Why is it necessary to develop test cases for both valid and invalid input conditions? Discuss with an example.
(b)Explain the process involved in testing a Client/Server System.

***