Subject Code: R16CC42OE4

IV B.Tech II Semester Adv. Supple Examinations, December-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) Define the terms Solar Azimuth angle and Zenith angle related to solar radiation geometry.
   (b) Explain the importance of Fill Factor.
   (c) What is the difference between biomass and biogas?
   (d) Write the principle of Tidal Power.
   (e) What is meant by Thomson effect?
   (f) Write any two advantages of MHD systems.

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

PART-B

                                                                    4 X 12 = 48

2. (a) Explain the solar radiation at the earth surface with neat sketch   [8+4]
   (b) Write the differences between conventional and non conventional energy sources

3. (a) Discuss briefly about solar pond and it's applications.
   (b) Describe the principle of solar photovoltaic energy conversion with a neat schematic and draw the I-V characteristics   [6+6]

4. What are the different biomass energy resources and what is the energy yield from each of them?

5. (a) Explain in detail about open and closed cycle ocean thermal electric conversion systems.
   (b) Explain various types of Geothermal resources.   [6+6]

6. (a) Explain Seeback and Peltier effect in relation to thermoelectric conversion.
   (b) List out the properties of materials used in a thermoelectric generator and discuss their applications.   [6+6]

7. (a) Explain the working principle and operation of an MHD generating system with a neat schematic.
   (b) Write a brief note on international status of MHD power generation and its future prospects.   [6+6]

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Subject Code: R16CC42OE5

IV B.Tech II Semester Adv. Supple Examinations, December-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
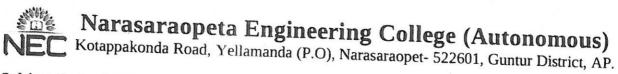All questions carry equal marks of 12.

PART-A

1. (a) Define embedded systems? Explain the importance of Embedded system in present Generations
   (b) List out few comparisons of SRAM and DRAM
   (c) Define watchdog timer and explain its importance
   (d) List out different Domain specific Example sin embedded systems
   (e) Define Task communication and explain its importance
   (f) Define simulator? Explain different types of simulators

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

PART-B

4 X 12 = 48

2. (a) Draw and explain the typical Embedded system architecture along with its applications [6M]
   (b) Explain the following terms in detail [2+2+2]
       (i) Data Collection (ii) Data Communication (iii) Data Processing

3. (a) What is Digital Signal Processor? Explain the role of DSP in embedded system design [6+6]
   (b) Explain the concept of Memory selection for embedded system along with examples

4. (a) Explain the role of Real time clock in embedded system [4M]
   (b) Explain the following terms in detail [2+2+2+2]
       (i) Bluetooth (ii) Wi-Fi (iii) Zig-Bee (iv)GPRS

5. List out different Operational and Non-Operational Quality attributes of embedded systems and explain them [12M]

6. (a) Discuss about Multiprocessing and Multitasking techniques used in RTOS? [6M]
   (b) Explain the following terms in detail [2+2+2]
       (i)Thread (ii) Task (iii) Process

7. (a) Explain about main software utility tool along with one example [6M]
   (b) Write short notes on the following [3+3]
       (i) Translation Tools (ii) Debugging Tools

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Subject Code: R16CE4201

IV B.Tech II Semester Adv. Supple Examinations, December-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 Elasticity of Demand.
(b) Discuss the features of oligopoly.
(c) Explain the contents of a ledger.
(d) What is Espirit De crops?
(e) Explain EOQ Analysis.
(f) What is CPM.

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

PART-B

4 X 12 = 48

2. Discuss the expectations to the law of demand.

3. (a) Calculate the Break Even Point from the following

Fixed Cost	:	Rs.8,000/-
Variable Cost	:	Rs.20,000/-
Sales	:	Rs.30,000/-

(b) Calculate profits with the help of the following deatls.

P.V. Ratio	:	35%
Sales	:	Rs.4,00,000/-
Fixed Cost	:	Rs.1,00,000/-

4. Explain the GAAP.

5. Differentiate between Theory X and Theory Y

6. List out the advantages and disadvantages of ABC Analysis

7. Discuss the functions of financial management.

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Subject Code: R16CE4202

IV B.Tech II Semester Adv. Supple Examinations, December-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

1. (a) What is HSC

   (b) Write the advantages of Prestressed Concrete

   (c) Write the losses of Prestress

   (d) What are the different types of flexural failure?

   (e) What is Allowable Stress?

   (f) Write on Anchorage zone

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

PART-B
$$4 \times 12 = 48$$

2. (a) Differentiate a fully prestressed member and a partially prestressed member

   (b) Discuss the advantages of prestressed concrete members over R.C.C members

3. (a) Explain with neat sketch Magnel Blaton system of Prestressing.

   (b) Explain Hoyer system of prestressing with sketch

4. (a) Write different types of losses in prestress.

   (b) A prestressed concrete pile, 250 mm square contains 60 pre tensioned wires each of 2 mm diameter uniformly distributed over the section. The wires are initially tensioned on a prestressing bed with total force of 300 kN. Calculate the final stress in concrete and percentage loss of stress in steel after all losses, given following data; ES=210 kN/mm^2, Ec=32kN/mm^2, Shortening due to creep =30 x 10^{-6} mm/mm per N/mm^2 of stress, total shrinkage = 0.0002 per unit length and relaxation of steel stress = 5% of initial stress.

5. Write down the step wise codal procedure for finding flexural capacity of PSC beams for different sections

6. (a) Discuss about the types of shear cracks in structural concrete members

   (b) A prestressed I section has the following properties. Area=55x10^{3}mm^2, Second moment of area =189x10^{7}mm^4 Statical moment about the centroid =468 x 10^{4}mm^3 Thickness of web=50mm. It Is prestressed horizontally by 24 wires of 5mm diameter and verfically by similar wires at 150 mm centers. All the wires carry a tensile stress of 900N/mm^2. Calculate the principal stresses at the centroid when a shearing force of 80kN acts upon this section.

7. (a) What are the various methods generally used for the investigation of anchorage zone stresses?

   (b) Explain about the stress distribution in end blocks

Subject Code: R16CE4212

IV B.Tech II Semester Adv. Supple Examinations, December-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) Describe the key components of a GIS
   (b) What are topological errors?
   (c) Define Spatial Data Model.
   (d) Differentiate the three methods of raster data structures
   (e) point out few Current problems in natural resource management
   (f) Differentiate between plan and map.

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

PART-B

                                                                 4 X 12 = 48

2. (a) What are the components of GIS? Explain in detail.
   (b) Define geospatial data. Differentiate between spatial data and attribute data.

3. (a) What are the various sources of error in geospatial data? Explain how to access them.
   (b) What is meant by data model? Explain various types of data models

4. (a) Explain in detail the various methods of data input
   (b) Explain with an example GPS based mapping.

5. (a) Examine the File Formats for Raster Spatial Data
   (b) Demonstrate the File Formats of Vector Spatial data

6. (a) what is cartographic modelling? what are the advantages and disadvantages of cartographic modelling in land evaluation and planning
   (b) Discuss about the methods of Spatial interpolation

7. Write the procedure of Georeferencing with available GCPS for a given toposheet

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Subject Code: R16EE4202

IV B.Tech II Semester Adv. Supple Examinations, December-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) What is the need of transmission interconnections?
   (b) What is a self-commutating converter? Where it is used in FACTS applications?
   (c) What is meant by power oscillations damping?
   (d) Why static compensator is not used as perfect voltage regulator?
   (e) Why firing angle delay is required in the operation of TCSC?
   (f) List the benefits of UPFC

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

PART-B

                                                                     4 X 12 = 48

2. (a) What are FACTS controllers? How power flow can be controlled in transmission lines using FACTS? List different types of FACTS controllers. **[6 M]**
   (b) Analyse the characteristics of high power devices **[6 M]**

3. (a) Explain basic concept of voltage-source converter (VSC) & its operation. **[6 M]**
   (b) What are harmonics? How to measure harmonics? **[6 M]**

4. (a) Briefly explain improvement of voltage stability using shunt compensation **[6 M]**
   (b) Explain how midpoint voltage regulation of a transmission line increases the power transfer capacity of the lines **[6 M]**

5. Discuss in detail the working of a Thyristor Switched Capacitor – Thyristor Controlled Reactor (TSC–TCR). Also draw their V-I operating characteristics. **[12 M]**

6. (a) Briefly explain the principle of operation of series capacitive compensation **[6 M]**
   (b) With a neat diagram, explain operation of GTO controlled series capacitor **[6 M]**

7. (a) What is the role of shunt and series converters in unified power flow controller. **[6 M]**
   (b) Analyze differences between IPFC and UPFC. **[6 M]**

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Subject Code: R16ME4201

IV B.Tech II Semester Adv. supple Examinations, December-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 are the functions and key elements of mechatronic system?
   (b) What is transducer? How the transducer differs from sensor?
   (c) Define bouncing and debouncing of switches.
   (d) Why binary system is preferred in digital system?
   (e) Distinguish between sensor and micro sensor.
   (f) What are the steps involved in the operation of a digital controller?

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

PART-B

4 X 12 = 48

2. a) Derive the mathematical modelling of spring mass damper mechanical system. [6]
   b) Explain briefly the various fluid systems building blocks. [6]

3. a) Explain the details about inductive transducer used to measure the linear displacement. [6]
   b) Write a brief note on following: [6]
      i. Hall-effect transducers   ii. Fibre optic transducers

4. a) Discuss the various methods by which speed of DC motor can be controlled. [6]
   b) Compare the performance of various electrical actuators and their applications. [6]

5. a) Draw the ladder logic diagram for OR, NOR, NAND and XOR logic gates. [6]
   b) i. Discuss the importance of 1's and 2's complement numbers. [3]
      ii. Prove the following Boolean identities: $(A + B) (A + C) = A + BC$ and
      $A + \overline{A}B = A + B$ [3]

6. a) Describe the latest trends of artificial intelligence in mechatronics. [6]
   b) What are the sensors used for condition monitoring? Explain any two. [6]

7. a) With neat sketch explain the architecture of a PLC. [6]
   b) Explain the various stages in design of mechatronics systems and state how it differs from the traditional approach. [6]

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Subject Code: R16ME4202

IV B.Tech II Semester Adv. Supple Examinations, December-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

1. (a) Write briefly about function of expansion valve and evaporator used in VCR.
   (b) Define dew point temperature.
   (c) Write the applications of refrigeration process in engineering field.
   (d) Differentiate the operating principle of heat pump and refrigeration.
   (e) Define bypass factor (BPF) for winter and summer air conditioning.
   (f) Define effective temperature and write comfort conditions of human thermal comfort.

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

PART-B

4 X 12 = 48

2. (a) Explain the Bell Coleman cycle and derive the expression for coefficient of performance of the cycle.
   (b) In a Bell-Coleman refrigeration plant air is drawn into cylinder of compressor at atmospheric pressure of 1 bar and temperature -7°C and it is compressed adiabatically to 5.5 bar at which pressure it is cooled to 18°C. It is then expanded in an expansion cylinder to atmospheric pressure and discharged into the refrigerating chamber. Find the coefficient of performance of the plant if the expansion is adiabatic.

3. (a) Explain the effect of sub cooling and super cooling on COP of VCR
   (b) A R-12 vapour compression refrigeration system has a condensing temperature of 50°C. The refrigeration capacity is 7 tons. The liquid leaving the condenser is saturated liquid and compression is isentropic. Determine (i) Refrigerant flow rate (ii) Power required to run the compressor (iii) COP of the system.
   Take enthalpy at the end of isentropic compression = 210 kJ/kg

   Take following properties of R-12

Temperature (°C)	Enthalpy (kJ/kg)	
	Liquid	Vapour
50	84.868	206.968
0	36.022	187.397

4. (a) Explain the desired properties of refrigerant.
   (b) Explain the working principle of (i) Thermostatic expansion valve (ii) Water cooled condenser

5. (a) Explain the working principle of Li-Br vapour absorption refrigeration system with neat sketch.
   (b) Explain the working of thermoelectric refrigeration system.

6. (a) Write a short notes on (i) Humidity ratio (ii) Apparatus dew point temperature (iii) Enthalpy
   (b) Define thermal comfort and list important parameters of thermal comfort. Enumerate the procedure for cooling load estimation of a room in a house.

7. (a) Explain both winter, summer air conditioning and year round air conditioning with the help of schematic diagram.
   (b) State the requirements of ventilation. Explain the working principle of filters and its effect on air conditioner performance.

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Subject Code: R16ME4206

IV B.Tech II Semester Adv. Supple Examinations, December-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) What is diffuse radiation?
(b) Give three types of solar energy collectors?
(c) Mention any two applications of solar energy?

(d) Write a short note on Betz criterion.
(e) Differentiate between Biomass and Bio Gas.
(f) Define geothermal energy.

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

PART-B

4 X 12 = 48

2. (a) What are the instruments used for measuring solar radiation and sunshine?
(b) Briefly discuss the following: i) extraterrestrial and terrestrial radiation
ii) conventional and Non-conventional sources of energy

3. (a) What are the main components of a flat plate solar collector, explain the function of each?
(b) Why orientation is needed in concentrating type collectors?

4. (a) With a neat sketch, explain the working of solar pond
(b) Explain the advantages of solar water heater with respective to conventional water heaters.

5. (a) Explain briefly about the vertical wind mills with neat sketch?
(b) What is meant by pitch control & Yaw control.

6. (a) What are biomass conversion technologies? Draw a schematic diagram to explain various conversion technologies and products.
(b) Distinguish between Fixed and Float drum Biodigesters.

7. (a) What are the main applications of geothermal energy?
b) Explain the concept of wet steam geothermal system.

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Subject Code: R16EC4201

IV B.Tech II Semester Adv. Supple Examinations, December-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) Define Co-Channel Interference in mobile communications

   (b) What is Frequency Diversity

   (c) Explain the Umbrella Pattern Antennas in detail

   (d) What is meant by frequency management?
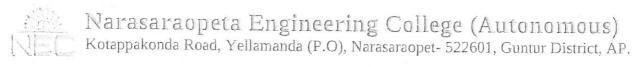
   (e) Explain the concept of Delaying Handoff

   (f) List out few comparisons of CDMA and TDMA techniques

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

PART-B

                                           4 X 12 = 48

2. (a) Describe the principle of operation of cellular mobile system and explain the cellular concept with a neat diagram   [6+6]

   (b) Explain the concept of Co-Channel Interference Reduction Factor Trunking in detail

3. (a) What are the different types of non co-channel interference in a cellular system? Explain [6+6]

   (b) Explain the effects of antenna design parameters for the interference in a cellular system.

4. (a) Draw and explain the concept of Roof-Mounted Antenna in detail [6]

   (b) Explain the fowling term sin detail [3+3]

      (i) Glass-Mounted Antennas   (ii) Mobile High-Gain Antennas

5. (a) Explain the concept of Channel Sharing and Borrowing along with one example [6]

   (b) Explain the following terms in detail [3+3]

      (i) Sectorization   (ii) Overlaid Cells

6. (a) What are the various handoff strategies based on algorithms of handoff? Explain in detail [6]

   (b) Explain the following terms in detail [3+3]

      (i) Difference Handoff   (ii) Forced Handoff

7. (a) What ate the different types of GSM channels? Explain in detail along with architecture

   (b) Draw the TDMA frame structure and explain the significance of each slot [6+6]

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Subject Code: R16EC4203

IV B.Tech II Semester Adv. Supple Examinations, December-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) Mention advantages of wireless sensor networks.
   (b) What is hidden node problem.
   (c) Mention classification of MAC protocols.
   (d) What are issues in designing a routing Protocol for Ad Hoc Wireless Networks?
   (e) What are design goals of a transport layer Protocol for Ad Hoc Wireless Networks?
   (f) What are challenges in security provisioning.

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

PART-B

4 X 12 = 48

2. Explain driving applications and enabling technologies for wireless sensor networks.   12 M

3. (a) Explain energy consumption of sensor nodes.   6 M
   (b) Explain physical layer and transceiver design considerations.   6 M

4. Describe contention based protocols with reservation mechanisms and contention based MAC
   protocols with scheduling mechanisms.   12 M

5. (a) Explain On-Demand routing protocols.   6 M
   (b) Explain Hierarchical routing protocols.   6 M

6. (a) Explain classification of transport layer solutions.   6 M
   (b) Explain TCP over Ad Hoc wireless networks.   6 M

7. (a) Explain network security attacks.   6 M
   (b) Explain symmetric and asymmetric key algorithms.   6 M

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Subject Code: R16EC4211

IV B.Tech II Semester Adv. Supple Examinations, December-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   [2+2+2+2+2+2]

1. (a) Define "Time-to-market".   2M

 (b) What is single-purpose processor? What are the benefits of choosing a single purpose processor over a general purpose processor   2M

 (c) How to evaluate a embedded processor's speed?   2M

 (d) What is the key feature of the PCI bus?   2M

 (e) Explain the important aspect of a real time system.   2M

 (f) Why Antifuses are implemented in a PLD?   2M

PART-B

         4 X 12 = 48

2. (a) Describe the characteristics of an embedded system in detail.   6M

 (b) Explain the various purposes of embedded systems in detail with illustrative examples.   6M

3. (a) Describe the procedure of designing a general-purpose processor.   6M

 (b) Design greatest common divisor based on custom single-purpose processor basic model.   6M

4. (a) Illustrate how program and data memory fetches can be overlapped in a Harvard architecture.   6M

 (b) Explain about main software utility tool   6M

5. Explain the Dynamic RAM,Pseudo static RAM and Static RAM   12M

6. (a) Briefly describe three computation models commonly used to describe embedded systems and their peripherals.   6M

 (b) Show why, in addition to ordered locking is necessary to avoid deadlocks.   6M

7. (a) Define various IC technologies and discuss the benefits of using them.   6M

 (b) What are general-purpose processor design models? And explain briefly any one.   6M

Subject Code: R16CS4203

IV B.Tech II Semester Adv. Supple Examinations, December-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 Software Quality?

   (b) Briefly explain about Testing Strategy

   (c) Define Static Testing?

   (d) What are the basic features of LOADRUNNER?

   (e) What is Acceptance and Operational Testing?

   (f) Write the basic difference between verification and validation testing?

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

PART-B

                                                      4 X 12 = 48

2.
   (a) Define the Software Quality Assurance. Give some of basis for Software Quality.

   (b) What are various Software Quality metrics? Explain? Explain with example the software
       complexity metrics. [6+6]

3.
   (a) Describe in detail about Building a Structured Approach to Software Testing

   (b) "Testing-an organizational issue". Justify the statement.[8+4]

4.
   (a) Explain with help of an example between white box and black box testing strategies.

   (b) What are different contents under which white box and black box testing techniques to
       evaluate a COTS component? [8+4]

5.   Explain about Win Runner for automatic software testing tools.12]

6.   Explain Software Testing Process in detail. [12]

7.
   (a) Define and explain Acceptance and Operational Testing

(b)Explain about Software Development Methodologies[6+6]

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