IV B.Tech II Semester Supple Examinations, April-2023
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) Examine the Scope of Managerial Economics.
   (b) Write a Short note on Marginal Costing
   (c) Illustrate the Double Entry System.
   (d) List out the functions of Management.
   (e) Discuss the methods of Production Management
   (f) Outline the Critical Path.

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

PART – B

                                                     4 x 12 = 48

2. Evaluate the significance of Demand Forecasting. Elucidate the various Methods of Demand Forecasting.

3. Explain the key features of Market. Write about the features of various Market Structures.

4. From the following information, prepare the Trading Account for the year ending on 31st March, 2008. Opening Stock Rs.1,50,000, Cash Sales Rs.60,000, Credit Sales Rs.12,00,000, Returns Outwards Rs.10,000, Wages and Salaries Rs.4,000, Carriage Inward Rs.2,000, Freight Inward Rs.3,000, Cartage Inwards Rs.1,000, Cash Purchases Rs.50,000, Credit Purchases Rs.10,00,000, Returns Inward Rs.20,000, Closing Stock as on 31-12-2008 Rs.84,000.

5. Present the various challenges faced by the Manager in the contemporary world. Discuss the McGregor Theory X and Theory Y.

6. Elucidate the Managerial and Operating functions of Human Resource Management

7. Explain the need of Project Management. Differentiate between PERT and CPM.

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CE4202

IV B.Tech II Semester Supple Examinations, April-2023
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 the necessity of using high strength concrete in prestressed concrete work ?.
   (b) Write about load balancing concept.
   (c) Explain Fressinet system of post tensioning.
   (d) Write about the loss of stress due to creep of concrete?
   (e) Describe briefly the modes of failure due to shear.
   (f) Explain line of thrust.

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

PART-B

4 X 12 = 48

2. (a) Illustrate with neat sketches
        i) Hoyer system   ii) Freyssinet system of pre-stressing
   (b) List the advantages and disadvantages of prestressed concrete over reinforced concrete.

3. A simply supported post tensioned beam 300 mm wide and 600 mm deep and span of 10 m is pre-stressed by successive tensioning and anchoring of three cables A, B and C. Cable A is parabolic with an eccentricity of 100 mm above the centroidal axis at support and 100 mm below the centroidal axis at mid span. Cable B is also parabolic with zero eccentricity at the support and 100 mm below the centroidal axis at the centre of the span. Cable C is straight and is kept 100 mm below the centroidal axis. The cables are tensioned one - by- one in the order A, B, and C. Determine the loss in prestress in the cables due to the elastic shortening of concrete for the following data.
   Cross - sectional area of each cable = 400 mm^2
   Initial stress in pre-stressing steel = 1200 MPa
   Compressive strength of concrete at transfer = 30 MPa
   Modulus of elasticity of pre-stressing steel = 200 GPa

4. (a) what are the different types of failure observed in a prestressed concrete ? Explain with sketch.
   (b) Compare prestressed concrete with reinforced concrete.

5. A continuous pre-stressed concrete beam ABC (AB=BC=10m) has a uniform rectangular cross section with a width of 100 mm and a depth of 300 mm. The cable is carrying an effective pre-stressing force of 360 kN parallel to the axis of the beam and located at 100 mm from the soffit.
   i) Determine the secondary and resultant moment at the central support B ii) If the beam supports an imposed load of 1.5 kN/m, calculate the resultant stresses at top and bottom of the beam at B. Assume density of the concrete as 24 kN/m^3.

6. A post tensioned beam of 15m of rectangular cross section, 250 mm wide and 475 mm deep, is 10 m long and carries an applied load of 10kN/m.UDL on the beam. The effective prestressing force in the cable is 650 kN. The cable is Parabolic with zero eccentricity at the supports and a maximum eccentricity of 150 mm at the center of span. Calculate the principal stresses at the supports.

7. (a) What is the necessity of providing reinforcements in the anchorage zone of a prestressed concrete beam? Give the supporting figures.
   (b) Define End block. What is the transmission length?

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Subject Code: R16CE4213

IV B.Tech II Semester Supple Examinations, April-2023
WATER RESOURSES ENGINEERING
(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 the terms Glaze and Mist

    (b) Explain Unit Hydrograph.

    (c) List out the methods used to find out peak flood.

    (d) Name the different types of canal sections with conditions for the most efficient section.

    (e) Name the factors affecting the pattern of sediment deposition in reservoirs.

    (f) Define the Spillway.

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

PART-B

4 X 12 = 48

2. (a) Write a note on the Drinking Water Quality Standards.   **[05]**

    (b) Estimate the Domestic Water Requirement of a town by the Geometric increase method for the year 2025, using the following data: **[07]**

Year	1955	1965	1975	1985	1995
Population (in thousand)	75	89	112	124	157

3. (a) Explain the factors affecting the runoff.   **[02]**

    (b) Explain the fan and fern-shaped catchment characteristics.   **[03]**

    (c) The stream flows due to three successive storms of 3.5, 4.7 and 4.2 cm of 5 hours duration each on a basin are given below. The area of the basin is 125.8 km2. Assuming a constant base flow of 25 cumecs, derive a 5-hour unit hydrograph for the basin. An average storm loss of 0.20 cm/hr can be assumed.   **[07]**

Time (hr)	0	3	6	9	12	15	18	21	24	27	30	33
Flow(cumec)	20	50	92	140	99	205	200	144	84	45	39	25

4. (a) Explain the different methods of avoiding damage by floods.   **[04]**

    (b) A channel has a bottom width of 250 m, depth 5m and side slopes 1:1. If the depth is increased to 8m by dredging, determine the percentage increase in velocity of flow in the channel. For the same increase in cross sectional area, if the channel is widened (instead of deepening), what is the percentage increase in the velocity of flow.   **[08]**

5. (a) Write a note on the Canal losses.   **[06]**

    (b) Explain the cost analysis of lined and unlined canals.   **[06]**

6. (a) Explain the classification of Reservoirs and the criteria for site selection for reservoir. **[05]**

(b) Explain the general principles of design of Reservoir. **[04]**

(c) Write a note on Reservoir Sedimentation Control. **[03]**

7. (a) Differentiate between Weirs and Barrages. **[04]**

(b) Explain the factors affecting the location of Dams. **[04]**

(c) Write a note on Energy dissipaters. **[04]**

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Subject Code: R16ME4201

IV B.Tech II Semester Supple Examinations, April-2023
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 translational mechanical system?
    (b) What is a sensor? Give an example.
    (c) List the advantages of Electro-Mechanical Linear Actuator.
    (d) Write any two applications of logical gates.
    (e) What is micro sensor application in Mechatronics.
    (f) Define the term Transient and steady state response.

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

PART-B

                                                                         4 X 12 = 48

2. (a) What is the difference between inductive and capacitive sensors?   (6m)
    (b) What are the components of a Mechatronic system? Explain their role in automation. (6m)

3. (a) Discuss about Fluid power actuators and piezoelectric actuators taking one example for each.

                                                                         (12m)

4. (a) Explain any two types of Mechanical actuation systems.   (8m)
    (b) Write short notes on solid state switches and solenoids   (6m)

5. (a) What is a number system? Explain about any two types of number systems   (8m)
    (b) Discuss about sequential logic circuit.   (4m)

6. (a) What are the fuzzy logic applications in mechatronics.   (6m)
    (b) What are the applications of Mechatronics in condition monitoring?   (6m)

7. (a) Differentiate Transient and steady state response systems.   (4m)
    (b) What are the stages in designing a mechatronics system?   (8m)

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Subject Code: R16ME4202

IV B.Tech II Semester Supple Examinations, April-2023
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) Define COP and how it is differ from efficiency?
   (b) Draw vapour compression refrigeration cycle on P-h scale.
   (c) How the primary refrigerants are classified?
   (d) In a vapour absorption refrigeration system, the heating, cooling and refrigeration takes place at temperatures of 100°C, 20°C and -10°C. Find theoretical COP of the system.
   (e) Define the human comfort. Explain the factors which affect human comfort.
   (f) Differentiate between central and unitary AC systems

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

PART-B

$$4 \times 12 = 48$$

2. (a) Explain the working of Regenerative Bell Coleman cycle with the help of schematic and T-s diagrams.
   (b) A Bell Coleman refrigeration cycle works between 1 bar and 5 bar with 85% compressor efficiency and 90% expander efficiency. Find the COP of the system and its tonnage. Assume air flow rate is 1 kg/s and the ambient temperature is 27°C and refrigerator temperature is 0°C.

3. (a) With the help of p-h diagram explain the effect of suction pressure and effect of delivery pressure on performance of a vapour compression system.
   (b) A food storage requires a vapour compression refrigeration system of 12 tons capacity at an evaporator temperature of 10°C and condenser temperature of 25°C. The refrigerant NH_3 is sub-cooled by 5°C before passing through throttle valve. The vapour leaving the evaporator coil is 0.97 dry. Find the COP and power required to run the plant. Neglect all losses.

4. (a) What factors are considered in selecting a refrigerant in domestic refrigerator and air conditioning plant for house? Also name the refrigerant used in each system.
   (b) Explain the working principle of evaporative condenser with the help of neat diagram and explain its advantages over other evaporators

5. (a) With the help of neat line diagram explain the working of Li-Br vapour absorption refrigeration system
   (b) What are the advantages and disadvantages of steam jet refrigeration system over other types of refrigeration system

6. (a) Why ventilation is required? Explain why different ventilation standards for different purposes are recommended?

   (b) For a room to be air conditioned, the conditions are given below:

   Outdoor conditions: 40°C DBT, 25°C WBT

   Required comfort conditions: 22°C DBT and 55%RH

   Seating capacity of room: 1420 persons

   Amount of outdoor air supplied : 0.283 m³/min per person

   If the required condition is achieved by adiabatic humidification and then by cooling,

   calculate: (i)   the   capacity   of   the   cooling   coil   in   tons   and   (ii) the capacity of humidifier in kg/hr.

7. (a) What are the different methods of humidifying the air? Explain the working of any one of the atomizing the water type humidifier.

   (b) Write short notes on air filters.

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Subject Code: R16ME4206

IV B.Tech II Semester Regular Examinations, April-2023
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 solar constant.
(b) Distinguish between flat plate and concentrating collectors.
(c) What is thermal energy storage system 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) Calculate the angle made by beam radiation with the normal to a flat collector on December 1 at 9AM solar time for location at 28 Degree 35Min North the collector is tilted at an angle of Latitude + 10 Degree with horizontal and pointing due south.

3.(a) Explain the working of Flat plate collector with the help of a neat sketch.
(b) What is concentration ratio? Explain about types of concentrating collectorswith help of line diagrams.

4. Explain the construction and working of a solar pond with neat sketch. What are its advantages and disadvantages?

5. (a)Describe with a neat sketch the working of a Wind Energy System with main components.
(b) Derive the expression for power developed due to wind

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) Describe principle of geo-thermal energy? What are the limitations of harnessing geo-Thermal energy?
(b) Explain the analysis of the energy content and its extraction for a hot dry rock type Geothermal resource.

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Subject Code: R16EC4201

IV B.Tech II Semester Supple Examinations, April-2023
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) Describe the important limitations of conventional mobile telephone systems
    (b) Explain different non co-channel interferences
    (c) Discuss about minimum separation of cell-site receiving antennas
    (d) Differentiate between Frequency management and Channel assignment
    (e) Explain the need of cell-splitting
    (f) Write the applications of TDMA & CDMA schemes in cellular communications.

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

PART-B

                                                                      4 X 12 = 48

2. (a) With neat diagram explain the major components of a cellular system   [4]
    (b) Explain the importance of cell splitting? What are the types of splitting?   [4]
    (c) Describe the procedure to calculate the maximum number of calls per hour per cell   [4]

3. (a) Design a directional antenna system for the worst case in k=7 system   [6]
    (b) Explain the importance of incident and elevation angles. In a mobile radio environment, the average cell-site antenna height is about 100 m, the mobile antenna height is about 5 m, and the communication path length is 10 Km. Find incident and elevation angles.   [6]

4. a)Explain about the following umbrella pattern antennas   [6]

    (i) Normal
    (ii) Broad band
    (iii) High-gain
    (b) Describe the procedure for choosing a cell-site   [6]
5. (a) Describe in detail about channel sharing and channel borrowing   [6]
    (b) Explain the different channel assignment algorithms   [6]
6. (a) Explain the various vehicle locating methods with neat diagrams   [6]
    (b) Derive the general formula for evaluation of dropped call rate   [6]
7. (a) Discuss in detail about channel coding and interleaving   [6]
    (b) Explain about physical and logical channels in GSM   [6]

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Subject Code: R16EC4203

IV B.Tech II Semester Supple Examinations, April-2023
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) What are the merits and demerits of WSNs?
   (b) Define MANET and list different types of MANETS.
   (c) Draw the diagram of MACA with Piggy-Backed Reservation.
   (d) Define OLSR.
   (e) Why does TCP not work well in ad hoc network?
   (f) Discuss about home automation?

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

PART-B

4 X 12 = 48

2. (a) Explain sensor node hardware components with diagram.

   (b) Define Wireless sensor networks and explain the challenges while designing the wireless sensor networks.

3. (a) Write in detail about Transceiver design considerations.
   (b) Describe security issues in MANETS.

4. (a) What are the design goals of a MAC protocol for Ad Hoc Wireless Network?

   (b) Discuss contention based protocols with reservation mechanism.

5. (a) Write about power-Aware routing protocols in WSNs.
   (b) Explain in detail about issues in designing a Routing protocol for Ad Hoc wireless networks?

6. (a) Explain about Ad Hoc Transport control Protocol network layer.

   (b) Discuss in detail about Transport layer protocols with neat sketch.

7. (a) Discuss about Node level software Platforms.

   (b) Explain network security attacks.

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Subject Code: R16EC4211

IV B.Tech II Semester Supple Examinations, April-2023
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) Differentiate between ASIC and PLD

   b) What is FSM, explain with help of an example of a seat belt alarm system as FSM.

   c) How pipelining will reduce the execution time of the processor?

   d) Which type of memory is used for cache memory and why?

   e) Why is semaphore a problem in RTOS? How can it be eliminated?

   f) With an example explain Behavioural Synthesis.

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

PART-B

                                                                                  [4X 12 = 48]

2. a) Identify various design metrics for development of a mobile phone.

   b) Differentiate between the IC technologies for Embedded system

3. a) Design a RT-Level Custom Single purpose processor for 4 to 1 multiplexer

   b) Describe the steps involved in RT-Level Custom single-purpose processor design

4. a) Explain the process of generating an executable image.

   b) Discuss how testing and debugging are critical to embedded system development.

5. a) Explain various types of memory used for program space.

6. a) Define the terms: finite-state machines, concurrent processes, real-time systems and real-time operating system.

   b) Design the four-road junction traffic light controller state machine using the FSMD model.

7. a) Differentiate Semi-custom IC technology and Gate Array Semi-Custom IC Technology

   b) Explain various types of emulators.

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Subject Code: R16CS4203

IV B.Tech II Semester Supple Examinations, April-2023
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) Define the term Software Quality?

(b) What is a Risk?

(c) Distinguish between Verification and Validation?

(d) List the various Testing Techniques?

(e) Describe Software Test Automation?

(f) Define Test Plan?

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

PART-B

4 X 12 = 48

2. (a) What is CMMI? Elaborate it in detail. – 6M

   (b) What is SQA plan? Explain various steps to develop and implement it.-6M

3. (a) Write the procedure to minimize the Risks? – 6M

   (b) Explain different stages involve in process of developing test strategy.- 6M

4. (a) Explain the concept of Benchmark? 4M

   (b) Demonstrate White box testing? – 8M

5. Write short notes on the following:
   (a) JUNIT   -4M
   (b) Requirements phase testing   -4M
   (C)Load Runner   -4M

6. Explain Software Testing Process with neat sketch. – 12M

7. (a) Explain different Software Development Methodologies.- 6M

   (b) Discuss about Post-Implementation Analysis. – 6M

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Subject Code: R16CC42OE4

IV B.Tech II Semester Supple Examinations, April-2023
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 solar constant and incident angle.
   (b) What are the different methods of storing solar energy.
   (c) Classify wind energy conversion systems.
   (d) Explain the fundamental principle of tidal energy generation.
   (e) What are the advantages and disadvantages of Thermo electric power generation.
   (f) List out the factors to be considered for selecting materials for MHD generator.

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

PART-B

4 X 12 = 48

2. (a) Differentiate between flat plate collectors and concentrating collectors.
   (b) Explain how the solar radiation is measured and data is obtained.   [6+6]

3. What do you mean by a Solar Energy storage system and how is it broadly classified explain in detail.   [12]

4. (a) Explain about the components of Wind Energy Conversion System.
   (b) Mention different biomass energy resources and what is the energy yield from each of them?   [6+6]

5. (a) What are the environmental impacts of geothermal energy?
   (b) Discuss the special applications of OTEC plants.   [6+6]

6. Explain the following with relevant expressions:
   (a) Seebeck effect (b) Peltier effect (c) Thompson effect.   [4+4+4]

7. (a) Explain the principle of MHD power generation.
   (b) What are fuel Cells and explain the operating principle of it.   [6+6]

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