

AR13

CODE: 13CE4037

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

IV B.Tech II Semester Supplementary Examinations, July-2018

PAVEMENT ANALYSIS AND DESIGN (Civil Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Write the design life of flexible and rigid pavements.
b) Define EWLF.
c) Define equivalent radius of resisting section.
d) What is meant by critical combination of loading?
e) What is the purpose of dowel bars in pavements?
f) Write the formula of radius of relative stiffness?
g) Write a short note on soil stabilization.
h) Differentiate between stability and flow value.
i) Mention the different failures in flexible pavements.
j) What is overlays?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What are the various functions and desirable characteristics of pavements? 7M
b) Differentiate between ESWL and EWLF. 5M
- (OR)
3. a) List out the environmental factors and how they influence the pavement surface in India context. 6M
b) Explain flexible and rigid pavements and bring out the points of differences. 6M

UNIT-II

4. a) Discuss the vertical stress distribution under the pavement. 6M
b) Determine the warping stresses at interior, edge and corner region in a 25cm thick concrete pavement with transverse joints at 11m interval and longitudinal joints at 3.6m intervals. The modulus of subgrade reaction is 6.9 kg/cm^2 . Assume temperature differential for day conditions to be 0.6°C per cm slab thickness and for night 0.4°C per cm slab thickness. Assume radius of loaded area as 15cm. Take $e = 10 \times 10^6 \text{ per}^\circ\text{C}$, $E = 3 \times 10^5 \text{ kg/cm}^2$ and poisons ratio is 0.15 6M

(OR)

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|-------|---|----|
| 5. a) | Explain Burmister's two layer and three layer theory. | 7M |
| b) | Explain wheel load stresses in rigid pavements. | 5M |

UNIT-III

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|-------|--|----|
| 6. a) | Explain the CBR and IRC methods of design of flexible pavements. Discuss the advantages and limitations. | 8M |
| b) | Write a short note on CBR charts in the design of flexible pavements. | 4M |

(OR)

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|-------|--|----|
| 7. a) | Write the procedure of AASHO Method of Flexible Pavement design. | 7M |
| b) | Write a short note on
(i) Expansion joints (ii) Contraction joints | 5M |

UNIT-IV

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|-------|---|----|
| 8. a) | Explain the Marshall's Method of Bituminous Mix design. | 7M |
| b) | Write the step wise procedure of WBM roads. | 5M |

(OR)

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|-------|--|----|
| 9. a) | Write the step wise procedure of Cement Concrete roads. | 6M |
| b) | Write the procedure for softening point test and Los Angeles Abrasion tes. | 6M |

UNIT-V

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|--------|--|----|
| 10. a) | What are various types of distresses in rigid pavement? Explain in detail. | 6M |
| b) | Describe the Benkelman Beam and its uses? | 6M |

(OR)

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|--------|--|----|
| 11. a) | Explain the necessity of design approach and method of strengthening of existing Pavements for Flexible overlay over flexible pavement | 8M |
| b) | Write a short note on pavement evaluation. | 6M |

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CODE: 13EE4037

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

IV B.Tech II Semester Supplementary Examinations, July-2018

POWER QUALITY MANAGEMENT (Electrical and Electronics Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Define power factor.
- b) What is equipment immunity?
- c) What are the causes of frequency variations?
- d) What is static transfer switch?
- e) What is transient overvoltage?
- f) What is the role of UPS while supply interruption.
- g) What are the differences between harmonics and transients.
- h) Define Total harmonic distortion.
- i) What are the benefits of power quality monitoring
- j) What is the use of true RMS meters?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Discuss main power quality issues which effect distributed generation. 6M
- b) What are standard indices for equipment immunity and power quality? 6M

(OR)

3. a) Define power quality. Explain the reasons for increased concern in power quality. 6M
- b) Explain briefly about international standards of power quality. 6M

UNIT-II

4. a) Describe voltage sags with examples. 6M
b) Give the control diagram for the maintenance of UPS for constant power and explain. 6M

(OR)

5. a) Explain shielded isolation transformer for low frequency disturbances. 6M
b) Write about voltage regulators with neat diagram. 6M

UNIT-III

6. a) Describe how utilities can deal with problems related to capacitor-switching transients. 6M
b) Discuss briefly about 6M
i) Utility System Lightning Protection
ii) Load Switching Transient Problems.

(OR)

7. a) Explain the transients due to power factor correction. 6M
b) Write about interruption of fault circuit. 6M

UNIT-IV

8. a) Explain individual and total harmonic distortion in detail. 6M
b) Discuss the effects of harmonics on AC motor performance. 6M

(OR)

9. a) Discuss the effects of harmonics on electrical power components. 6M
b) Write about harmonic current mitigation method. 6M

UNIT-V

10. a) Explain power quality measurement devices. 6M
b) What is Transient Disturbance Analyzer and True RMS Meter. 6M

(OR)

11. a) Write short note on the following (i) Harmonic analyzer (ii) Flicker meter. 6M
b) Draw the block diagram of advanced power quality monitoring systems. Explain in detail. 6M

AR13

CODE: 13ME4040

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

IV B.Tech II Semester Supplementary Examinations, July-2018

**UNCONVENTIONAL MACHINING PROCESSES
(Mechanical Engineering)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) State any drawback of unconventional machining process
- b) What is the range of ultrasonic frequency.
- c) What is Amplitude of USM Machining.
- d) State the approximate MRR in AJM
- e) How does grain size of work piece effect surface quality of product in Chemical milling.
- f) Explain the term electro chemical equivalent of a material in ECM.
- g) State prominently used dielectric material used in EDM
- h) State the temperature of plasma in plasma arc machining
- i) State the voltage value supplied to electrons at which EBM takes place.
- j) State any application of LBM

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Write any four important reasons why the unconventional machining processes are used over conventional machining. Explain with salient points. 6M
- b) Classify the different types of Unconventional Machining Processes. 6M

(OR)

3. a) What is ultrasonic machining? Explain the process of metal removal in ultrasonic machining. 6M
- b) Explain the main functions of Magnetostrictive transducer, concentrator, Abrasive slurry in USM 6M

UNIT-II

4. a) What are the precautionary measures to be taken during machining of components on Abrasive Water Jet machine? Discuss briefly. 6M
- b) Explain the various components of Abrasive Water Jet Machine. 6M

(OR)

5. a) Explain the various process parameters which affect the surface finish of the component machined on Abrasive Jet Machine? 6M
- b) Explain the main functions of Accumulator, catcher, direction control valve in Water Jet machine. 6M

UNIT-III

6. a) Explain the differences between chemical machining and electro chemical machining processes. 6M
- b) During machining of iron (Atomic weight = 55.85, valency = 2, density = 7.85g/cm^3), equilibrium gap is approx. 0.125mm and the measured value of specific conductance of electrolyte = $0.2\ \Omega^{-1}\text{cm}^{-1}$. Faradays constant is 26.8Ah, applied voltage is 10 V and overvoltage is 1.5 V. Calculate the value of feed rate, f. in ECM 6M

(OR)

7. a) What are maskant and etchant in Chemical Machining process? Discuss the different methods of applying etchants. 6M
- b) Describe the working mechanism of Electro Chemical Machining Process with a sketch. 6M

UNIT-IV

8. a) Explain any four factors that affect the material removal rate in Electric Discharge Machining with a sketch? 6M
- b) Describe, with the help of simple sketch, the process of Wire-cut EDM. 6M

(OR)

9. a) Describe the process of EDM with the help of neat sketch. 6M
- b) Enumerate the differences between EDM and ECM. 6M

UNIT-V

10. a) Discuss the factors that affect the quality of the product machined using plasma machining process. 6M
- b) What are the main parameters effecting the material removal process of EBM 6M

(OR)

11. a) Explain the precautionary measures to be taken while machining the components on EBM and LBM. 6M
- b) Explain the working principle involved in plasma machining method. 6M

AR13

CODE: 13EC4044

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, July-2018

EMBEDDED & REAL TIME OPERATING SYSTEMS

(ELECTIVE – IV)

(Electronics & Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Mention different types of memories.
b) Define microprocessor and micro controller
c) What is cache replacement policy?
d) How much scheduling is important in Real Time systems?
e) Important requirements for designing hand held devices OS?
f) What are main memory data bases?
g) What are the instruction set features useful for embedded programming?
h) What are the different CPU buses? State the function of each one.
i) State the important requirements to develop Network based embedded systems.
j) List the process scheduling policies.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What is the difference between microprocessor and microcontroller? 6M
b) What is Digital Signal Processor (DSP)? Explain the role of DSP in embedded system design? 6M

(OR)

3. a) What is an embedded firmware? What are the different approaches available for embedded firmware development? 6M
b) Explain the role of microprocessors and controllers in embedded system design? 6M

UNIT-II

4. a) Develop an efficient algorithm for GCD, convert it to FSM and show the optimized FSM. 6M
b) What is sequential program model? 6M

(OR)

5. a) Compare state machine and sequential program models. 6M
b) How to describe a system as state machine? 6M

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SET-1

UNIT-III

6. a) Explain UART communication. 6M
b) List out the differences between Blocking communication and Non-Blocking communication? 6M

(OR)

7. a) Explain IEEE 802.11 and compare with Bluetooth. 6M
b) Explain RS-422. And how is it different from RS-232? 6M

UNIT-IV

8. a) Explain any three scheduling algorithms. 6M
b) Explain about interrupt service routines (ISR) 6M

(OR)

9. a) With suitable examples explain how do you create and delete a semaphore. 6M
b) Write short notes on the following 6M
a) Semaphores in RTOS
b) Re-entrancy

UNIT-V

10. a) State and explain the various development tools required for embedded Linux applications 6M
b) Explain the architecture of a real time system. What are the different issues for designing a real time system? 6M

(OR)

11. a) What is Linux kernel configuration? Explain the steps in Linux kernel configuration. 6M
b) Write a short note on embedded OS trends. 6M