

D 33734

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Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Printing Technology

PT 19 705A—ADVERTISING MANAGEMENT

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. Explain the concept of advertising.
2. Discuss the role of advertising in stimulating attention and facilitating retention by giving examples.
3. How do marketing firms use consumer behaviour ?
4. Write notes on media objectives.
5. Discuss the features of TV copywriting.
6. What are the tips for writing web content ?
7. Explain the features of internet advertising.
8. Write notes in publication media.
9. What are the criteria for copy testing ? Explain.
10. Explain the structure of copy.
11. Discuss the contribution of pictures and the criteria for including them in advertising production.
12. Compare media strategy and tactics.
13. What is the significance of marginal analysis in advertising? Discuss.
14. Write notes on co-operative advertising.
15. Discuss the historical development of advertising agencies.

(10 × 5 = 50 marks)

Turn over

Part B

*Answer **one** full question from each section.
Each question carries 10 marks.*

16. Discuss the role of printing presses in advertising.

Or

17. Discuss the legal aspects of advertising.

18. Explain Dagmar approach for setting advertising objectives.

Or

19. Discuss various methods of measuring the effectiveness of advertising.

20. Discuss media planning concept, media decision tool, and media plan strategy.

Or

21. Discuss the concept, structure, and characteristics of media.

22. Explain various steps involved in the production of a print advertising.

Or

23. Explain various types of copy testing and how to ensure the validity and reliability of copy test.

24. Discuss special service groups and coordination of advertising agencies with personal selling and distribution channels.

Or

25. Discuss the stages of concept, planning, execution and evaluation of the advertising campaign.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Mechanical Engineering

ME 19 705 F—HEATING VENTILATION AND AIR-CONDITIONING SYSTEM

Time : Three Hours

Maximum : 100 Marks

Part A

Answer any ten questions.

Each question carries 5 marks.

1. Define COP and prove that $COP_{\text{Heating}} = COP_{\text{Cooling}} + 1$.
2. Explain the terms Refrigeration effect and Ton of refrigeration.
3. Differentiate Split Air-Conditioner and Window Air-Conditioner.
4. An air refrigeration system works on Bell - Coleman cycle. It draws air at the rate of 1 kg/s from the cold chamber at 1 bar and 5° C. Air is compressed to 7 bar and then is cooled to 25°C before sending it to expansion cylinder. Given $\gamma = 1.4$ and $C_p = 1.005$ kJ/kg-K. What is the Refrigeration effect for this system in tonne per hour ?
5. Define the following psychrometric terms :
 - a) Specific enthalpy ;
 - b) Relative humidity ; and
 - c) WBT.
6. Write the Advantages and Disadvantages of Chilled water system of air conditioning.
7. The atmospheric air at DBT is 20° C. It enters a heating coil which is maintained 50° C. If the air leaves coil at 35° C what will be the efficiency of the coil ?
8. Draw cooling graph process and explain.
9. What are the sources of latent heat gain occurs ? Explain.
10. Classify the types of air duct.
11. With neat sketch define laminar and turbulent flow.

Turn over

12. What is Bernoulli equation ?
13. What are the needs of ventilation ?
14. What are the advantages and disadvantages of Mechanical Ventilation system ?
15. Write down the benefits of good ventilation ?

(10 × 5 = 50 marks)

Part B

Each question carries 10 marks.

16. Briefly explain the Split Air-Conditioning Systems with neat drawing. Mention its advantages and disadvantages.

Or

17. Explain the refrigeration cycle and its components.
18. Briefly explain the Air Conditioning System components.

Or

19. The humidity ratio of atmospheric air at 28°C dry bulb temperature and 760 mm of mercury is 0.016 kg / kg of dry air. Determine : 1. partial pressure of Water Vapour ; 2.relative humidity ; 3. dew point temperature ; 4. specific enthalpy ; and 5. Vapour density.
20. Design cooling load takes into account all the loads experienced by a building under a specific set of assumed conditions. Mention those assumptions.

Or

21. Explain the design supply air calculations.
22. Illustrate the step-by-step procedure for the design of air duct.

Or

23. A two-pipe individual-loop low-temperature hot water heating system is used to heat a factory that has a layout shown in Fig. 8.7. At winter design conditions, hot water is supplied to the heated space at a temperature of 190°F (88°C) and returns from the baseboard finned-tube heaters at a temperature of 150°F (65°C).
 - a) If the space heating load for the largest room (facing north) is 90,000 Btu/h (26.4 kW) and for the northwest corner room is 11,000 Btu/h (3.2 kW), and if steel tubes and fins are used, determine the number of feet of finned tubing required for each of these two rooms.

- b) If a pressure drop of 1 ft/100 ft (1 m/100 m) of pipe is used and the hot water system is equipped with an open expansion tank, determine the diameter of the hot water supply main for these two rooms.
- c) Divide this hot water system into appropriate control zones, or individual loops.

24. Explain the Factors Affecting the ventilation rates in buildings.

Or

25. Estimate the Ventilation rate by Heat Removal Method and Occupancy Method.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Information Technology

IT 19 705 A—MACHINE LEARNING

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. State any five applications of machine learning applications in detail.
2. What is learning ? Enumerate the characteristics of learning.
3. Describe Find-S algorithm in detail.
4. Highlight the basic parameters involved in solving problems in genetic algorithm.
5. Tabulate the differences between biological and artificial neurons.
6. Enumerate the applications of genetic algorithm.
7. Explain the features of Bayesian learning methods.
8. Summarize the basic probability formulas.
9. Explain the concept of Bayesian belief networks in detail.
10. Mention the advantages and disadvantages of K-nearest neighbour learning.
11. Highlight the key differences between lazy and eager learning.
12. Derive the procedure for locally weighted linear regression.
13. Write the pseudocode for sequential covering algorithm.
14. Give the general form of propositional resolution operator.
15. Enumerate the key properties of PROLOG-EBG.

(10 × 5 = 50 marks)

Part B

*Answer one full section from each question.
Each question carries 10 marks.*

16. a. Elaborate the domain areas in which machine learning algorithms can be applied.
Or
b. Summarize the concept of inductive bias of Candidate-Elimination algorithm with diagram.
17. a. Explain the architecture and algorithm of simple perceptron with diagram.
Or
b. Explicate the basic structure of Genetic algorithm.

Turn over

18. a. State and explain EM algorithm for estimating means of a mixture of Normal distributions.

Or

b. Explain weighted majority algorithm in mistake bound model of learning.

19. a. Describe the working of K-nearest neighbour learning algorithm with diagram.

Or

b. Discuss briefly about radial basis functions in approximation of functions.

20. a. Summarize FOIL algorithm in learning sets of first order rules in detail.

Or

b. Discuss the algorithm for learning Q.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Electronics and Communication Engineering

EC 19 705—E INTRODUCTION TO MEMS

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. What are the applications of MEMS ?
2. Explain the working principle of microgrippers.
3. Explain the general stress-strain relationship with neat sketches.
4. Explain any two applications of thermal sensors.
5. Explain the working principle of magnetic actuators.
6. List the properties of piezo electric materials.
7. What information does the force scaling vector provide to the MEMS designer ?
8. List the steps involved in photolithography with neat sketches
9. What is the use of Silicon dioxide in MEMS fabrication process ?
10. Differentiate RF MEMS and Optical MEMS.
11. Explain the levels of micro systems packaging.
12. Describe the role of sacrificial layers in surface micromachining with figures.
13. List the applications of RF MEMS devices.
14. Explain the BioMEMS.
15. Explain anodic bonding with figures.

(10 × 5 = 50 marks)

Turn over

Part B

*Answer any **one** question from each module.*

16. Explain the working principle of diaphragms. Also explain the applications of it.

Or

17. Explain the operating principle of two types of micro motors with suitable schematics.

18. Determine the moment of inertia for a beam under longitudinal strain and also find the flexural formula.

Or

19. Explain the purpose of micro cantilevers in MEMS systems. What is the relevance of spring constant (k) of the mechanical structure in the micro system ?

20. Explain the steps involved in ion implantation. State the chemicals used in each of the stages along with the operating conditions.

Or

21. Explain various scaling laws in miniaturization.

22. State two advantages of LIGA process over other micro machining techniques. Explain with block diagram the steps in LIGA process. State at least one commonly used chemical in each of the steps.

Or

23. Explain with figures the steps in surface micro machining. Discuss the various fabrication challenges associated with surface micromachining.

24. Explain the different bonding techniques for MEMS.

Or

25. Explain the MOEMS and NEMS technologies.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Electrical and Electronics Engineering

EE 19 705 F—SWITCHED MODE POWER CONVERTERS

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

- I. 1 Compare isolated and non-isolated dc-dc converters.
2 What is the principle of voltage control in the basic DC-DC switching converter ?
3 Discuss the advantages of isolated dc-dc converters.
4 Explain the drawback of linear power supplies ?
5 What is a power conditioner ? Mention its applications.
6 Compare basic forward converter and practical forward converter
7 Explain the sinusoidal PWM switching scheme.
8 State the significance of ripples in the output waveforms
9 How the output voltage is controlled by voltage cancellation ?
10 Describe over modulation in PWM switching.
11 Enumerate the effect of blanking time on voltage in PWM inverters.
12 Explain a method of voltage control within the Inverter ?
13 Compare series and parallel resonant circuits.
14 Explain the resonant switch converters ?
15 State the advantages and limitations of ZVS converters.

(10 × 5 = 50 marks)

Turn over

Part B

Answer any five questions.

- II. 1 A buck -boost regulator has an input voltage of 12 V. The duty cycle is 0.6 and the switching frequency is 25 kHz. For an Inductance of 250 μ H and for a filter capacitance of 220 μ F the average load current is 1.5 A. Determine a) Average output voltage ; b) peak to peak ripple voltage ; c) peak to peak ripple current of an inductor ; and d) peak current of transistor.

Or

- 2 Design a Buck-Boost converter circuit having parameters, input voltage = 24 V, $D = 0.4$, load resistance = 5 ohm, $L = 20$ micro H, $C = 80$ micro F. Determine the output voltage, average inductor current, Maximum and minimum value of inductor current and the output voltage ripple. Assume a switching frequency of 100 kHz.
- 3 With circuit diagram and waveforms, explain the principle of operation of a push pull converter. Derive expressions for duty ratio, peak current through the switch and peak voltage across the switch.

Or

- 4 Explain the working of double ended fly back converter with neat diagram and waveforms ?
- 5 Briefly describe the operation of a square wave full bridge inverter with neat circuit diagram and waveforms. Also derive the output voltage.

Or

- 6 Explain suitably the concept of PWM with unipolar and bipolar voltage switching.
- 7 With the help of neat diagram and waveforms explain the three phase voltage source inverter operation using space vector modulation.

Or

- 8 Explain in detail about the square and sine wave switching schemes used in inverter ?
- 9 With the help of neat circuit diagram and relevant waveforms, discuss the operation of parallel loaded resonant dc-dc converter in discontinuous current conduction mode.

Or

- 10 Discuss the operation of ZCS resonant switch converters. Draw the circuit diagram and relevant waveforms.

(5 \times 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Printing Technology

PT 19 704—PRINTING MACHINERY AND MAINTENANCE

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. Discuss the objectives of the maintenance department.
2. What are the modern trends in maintenance ? Explain.
3. Why is it important to give training on maintenance to the staff ? Explain.
4. Discuss the ideal characteristics needed for a dampening system.
5. What are the factors to be considered for plate handling in an offset machine ?
6. Write notes on pre-press bottlenecks.
7. Explain the maintenance of plate setters and processors.
8. Discuss the components of the lubrication chart.
9. What are the lubricating instructions given for machine operators ? Discuss.
10. Discuss the components of an electric motor and how to maintain it.
11. Write notes on the accessories of a compressor.
12. Discuss the features of limit switches.
13. Write notes on belt slippage.
14. Discuss the maintenance of gears.
15. What are the advantages and disadvantages of belt drives.

(10 × 5 = 50 marks)

Turn over

Part B

*Answer **one** full question from each section.
Each question carries 10 marks.*

16. Discuss the features of different types of maintenance activities.

Or

17. Explain maintenance planning, scheduling, controlling, and maintenance records.

18. Discuss various equipments required for erection.

Or

19. Explain the erection procedure for printing machines.

20. Explain the functions and characteristics of lubricants.

Or

21. Explain the reconditioning of paper transport systems, cylinder bearing supports and eccentrics.

22. Discuss electric panels, electrical apparatus, and electrical wiring on printing machines.

Or

23. Discuss the applications and features of compressed air systems.

24. Explain different types of pulleys.

Or

25. Discuss different types of bearings.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Mechanical Engineering

ME 19 704—ADVANCED AUTOMOBILE ENGINEERING

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. Explain the different types of loads acting on the chassis frame.
2. Schematically explain the electronic fuel injection system.
3. List any five requirements of an automobile clutch.
4. Explain the working of a torque converter with a neat sketch.
5. Explain with the help of a neat sketch the construction of a propeller shaft.
6. Explain the construction of rear axle used in trucks with the help of a sketch.
7. Describe the classification of vehicle brakes from different considerations.
8. Explain the construction of disc type wheel with a neat sketch.
9. List any five requirements of a good automobile tyre.
10. Draw the layout of a typical steering system of an automobile and label the various parts.
11. Explain Mac-pherson type suspension system with diagram
12. Explain the principle of working of a starting motor.
13. List any three advantages and limitation of electric vehicle.
14. List any three merits and demerits of Stratified charge engines.
15. List the challenges in using hydrogen as fuel for automobiles.

(10 × 5 = 50 marks)

Part B

Each question carries 10 marks.

16. Sketch and explain the automotive chassis with their subsystems

Or

17. With a neat sketch explain the construction and working of a common rail direct injection system in diesel engines.

Turn over

18. Describe with help of neat sketches the construction and operation of 3+1 speed constant mesh gear box.

Or

19. Describe with help of a neat sketches the construction and working of a differential in an automobile.

20. Explain each component of Antilock Braking System (ABS) and also discuss the working of ABS with neat sketches.

Or

21. Explain the construction of conventional and tubeless tyres with suitable sketches.

22. Explain the following :

- | | |
|-----------------------------|--------------------------|
| (i) Camber. | (ii) Caster. |
| (iii) King pin inclination. | (iv) Toe-in and Toe-out. |

Or

23. Explain the construction and working of a telescopic type shock absorber with the help of neat sketches.

24. With neat sketches explain the series and parallel configuration of hybrid system.

Or

25. Explain the construction and working principle of fuel cells with neat sketches.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Information and Technology

IT 19 704—CLOUD COMPUTING

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. State and explain any *five* benefits of cloud computing.
2. Compare public and private cloud.
3. What did you meant by community cloud ? Give an example.
4. How are web applications handled by the cloud ?
5. Brief the role of cloud service providers.
6. What is Infrastructure as a Service ?
7. Discuss the role of a service manager.
8. Explain in brief the significance of a hybrid cloud.
9. What are Thin Clients ? Explain.
10. State and explain the advantages of Bungee connect.
11. How do server respond to thin clients ? Discuss with an example.
12. Discuss in brief the significance of virtualization.
13. What are the parameters required to be considered for signing a contract ? Discuss.
14. Explain in brief the requirements of Cloud monitoring and its associated tools.
15. How are data migrated in the cloud ? Discuss in brief.

(10 × 5 = 50 marks)

Turn over

Part B

Answer one full section from each question.

Each question carries 10 marks.

16. Explain the layers and the various types of cloud in detail.

Or

17. State the essential characteristics of cloud computing. Also, explain the concept of cloud supply chain.

18. Explain in detail the requirements, challenges and design issues of cloud storage.

Or

19. Enumerate the various ways to access resources in the cloud.

20. Discuss in brief the software consideration of SaaS platform and brief its limitations.

Or

21. Mention the Software plus Services provided by the Microsoft. Discuss its advantages.

22. How will you develop your own cloud application ? List the necessity steps to sustain the cloud applications.

Or

23. How is the cloud environment effectively integrated with cast iron and QuickBase ? Explain.

24. Enumerate various Enterprise class cloud offering for end users.

Or

25. Discuss in detail the technologies for data security in cloud computing.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Electronics and Communication Engineering

EC 19 704—OPTICAL COMMUNICATION

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. Define the terms acceptance angle and V number.
2. Write a short note on attenuation in fibers.
3. What is numerical aperture ?
4. Write a note on quantum limit to receiver sensitivity.
5. What is meant by shot noise ?
6. What is ISI ?
7. Outline the term quantum efficiency.
8. Draw and explain the structure of laser diode.
9. Explain the switching characteristics of LED.
10. Give an account about optical switches and necessary diagrams.
11. Illustrate with the help of figures, the working of an optical isolator.
12. Explain about semiconductor amplifier ?
13. Describe about WDM and its applications.
14. Outline about FTH.
15. Describe about SONET/SDH.

(10 × 5 = 50 marks)

Turn over

Part B

*Answer any **one** question from each module*

16. Describe about single mode and multimode fibers with necessary diagrams.

Or

17. What is Dispersion ? Describe in detail dispersion in single and multimode fibers.

18. Differentiate between homodyne and heterodyne systems and their structures.

Or

19. Give an account on degradation due to fiber dispersion and degradation due to non-linear effects in fiber propagation.

20. Explain the following terms :

(a) Line width ;

(2 marks)

(b) Phase noise ; and

(2 marks)

(c) Principle of operation of avalanche photodiode.

(6 marks)

Or

21. Draw and explain structure and working of PIN photodiode.

22. In detail, explain optical couplers and splitters.

Or

23. Explain in detail about Raman amplifier.

24. What is optical Soliton ? What are its applications ?

Or

25. Describe OTDM technology. List its various issues.

[5 × 10 = 50 marks]

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Electrical and Electronics Engineering

EE 19 704—SOFT COMPUTING TECHNIQUES

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

- I. 1 Distinguish between supervised learning and unsupervised learning ?
- 2 Draw the basic model of Adaline network and Madaline Network.
- 3 For derivative -based learning procedure why a sigmoidal function is used instead of a step function ?
- 4 Explain the limitations of Fuzzy system ?
- 5 How is fuzzy relation converted into a crisp relation using lamda-cut process ?
- 6 Explain a Fuzzy inference System ?
- 7 Write short notes on fuzzy propositions.
- 8 What is cardinality of a Fuzzy set ? Whether a power set can be formed for a fuzzy set ?
- 9 Explain Centre of gravity method of defuzzification.
- 10 What is meant by Roulette wheel selection in GA ?
- 11 Explain how do you select mutation in GA ?
- 12 Differentiate between phenotype and genotype.
- 13 List few applications of support vector machines and explain any one.
- 14 Write about swarm intelligence.
- 15 Explain harmony search in brief.

(10 × 5 = 50 marks)

Turn over

Part B

Answer any five questions.

- II. 1 Discuss in detail the various types of activation function used in neural network with aid of mathematical representation and its output.

Or

- 2 Explain the single perceptron with its learning algorithm and its seperability and convergence property.

- 3 Explain with neat block diagram the various components of a fuzzy logic system.

Or

- 4 Explain the different types of membership function used in fuzzification process ?

- 5 Discuss the methods of aggregation of fuzzy rules.

Or

- 6 Differentiate between mamdani FIS and sugeno FIS.

- 7 Explain the significance of adjustment of free parameters when implementing Genetic Algorithm.

Or

- 8 Write down the differences and similarities between genetic algorithm and other traditional methods.

- 9 With a neat flowchart, explain the algorithm of SVM.

Or

- 10 Implement a vehicle routing problem using the concept of particle swarm optimization.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Printing Technology

PT 19 703—PRINT PLANT LAYOUT AND FACILITY DESIGN

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. What are the objectives of a good plant layout ? Brief.
2. Explain the factors to be considered for new facility design.
3. List and explain the features of 4 types of layout.
4. Discuss the features of the S-type flow pattern.
5. Discuss the facility specification for flammable solvents.
6. How do you determine the printing plant area requirement ? Explain.
7. Explain 6 principles of plant layout.
8. Write notes on sampling.
9. Explain the significance of facility specification in a printing press.
10. Write notes on En-masse chain conveyor.
11. List and explain the components of a belt conveyor.
12. Explain the purpose and working principle of an inking belt steel plate.
13. Discuss automatic feeding devices for conveyors
14. Write notes on gravity chute roller runways.
15. Write notes on handling large web reels and printed piles in printing industry.

(10 × 5 = 50 marks)

Turn over

Part B

*Answer **one** full question from each section.
Each question carries 10 marks.*

16. Discuss printing plant layout essentials.

Or

17. Explain the importance of material movement factor in plant layout.

18. Discuss the features and specifications required for the following support services;

- a) Receiving ;
- b) Maintenance and
- c) Waste paper and trash removal.

Or

19. Write notes on site planning and fundamentals of foundation design.

20. Discuss the facility specifications for Web offset room.

Or

21. Discuss about ware house and storage of materials.

22. Discuss 8 various properties of paper that will be inspected as an incoming material and their testing procedure.

Or

23. Discuss various properties of ink that will be inspected as an incoming material and their testing procedure.

24. With neat sketches, explain the 4 types of Chain hand hoists.

Or

25. Write notes on Monorail telpher and Vertical Skip elevators.

(5 × 10 = 50 marks)

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Mechanical Engineering

ME 19 703—MECHATRONICS

Time : Three Hours

Maximum : 100 Marks

Part A*Answer any ten questions.**Each question carries 5 marks.*

1. Brief on the following with terms that are used to define the performance of transducers:
 - (i) Range and span ; and
 - (ii) Hysteresis error
2. Explain how angular measurements are made using a resolver.
3. Explain how a piezoelectric sensor detects the frequency of vibration.
4. With a neat sketch, explain the construction and working of a double acting cylinder.
5. Brief on the working of an external gear motor.
6. Sketch a hydraulic circuit to control the extension velocity and explain the same.
7. What is the function of a Pneumatic air volume booster ? Brief on any *two* advantages of the volume booster.
8. With a neat sketch, brief on force balance technique.
9. Explain the purpose of bellow and LYDT in a PI convertor.
10. Brief on the working of hydrostatic bearings.
11. Explain open loop system with an example.
12. Brief on the basic elements of a PLC.
13. Explain hydraulic resistance, capacitance and inheritance.

Turn over

14. Compare brush and brushless DC motors with respect to speed range, control, noise, rotor inertia and life.
15. Explain the working of any one type of tactile sensor.

(10 × 5 = 50 marks)

Part B

Each question carries ten marks.

16. With neat sketches, explain the construction and working of any *two* types of sensors used to monitor the pressure of boilers. (5 + 5)

Or

17. Elaborate on the working of absolute and incremental encoders. (5 + 5)

18. With a neat sketch, explain the construction and working of a 3/2 direction control valve.

Or

19. Illustrate the working of a simple pressure relief valve.

20. With a neat sketch, explain the construction and working of a flapper nozzle.

Or

21. Illustrate the construction and working of an IP converter.

22. Elaborate on the working of a recirculating ball screw mechanism.

Or

23. With an example, elaborate on adaptive controllers for machine tools.

24. What are mathematical models ? Explain any *three* building blocks of mechanical systems.

Or

25. With a neat sketch, explain any *one* type of stepper motor.

(5 × 10 = 50 marks)

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Name.....

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Information and Technology

IT 19 703—ARTIFICIAL INTELLIGENCE

Time : Three Hours

Maximum : 100 Marks

Part A*Answer any ten questions.**Each question carries 5 marks.*

1. List the requirements and challenges of Artificial Intelligence.
2. Solve Best First search strategy with an example.
3. Differentiate Data driven and Goal driven search.
4. Compare and contrast Model based agents and Utility based agent
5. What is meant by frames in artificial intelligence ? Explain with suitable example.
6. Write an algorithm to calculate Min-Max decisions.
7. Mention the predicate calculus language syntax components.
8. Differentiate universal quantifiers and existential quantifiers.
9. Write the resolution for predicates.
10. Define Backpropagation. What are the types of Backpropagation networks ?
11. How will you measure generalization ?
12. Explain communication among agents.
13. Discuss in brief the conditional branching in LISP.
14. List the applications of LISP.
15. What is a Macro ? How are macros created ?

(10 × 5 = 50 marks)

Turn over

Part B

Answer one full section from each question.

Each question carries 10 marks.

16. a) Summarize the various uninformed search strategies with suitable examples.

Or

- b) Explain the following heuristic search strategies :

(i) AO* search ; and

(ii) A* Search.

17. a) Explain scripts in detail in the context of artificial intelligence.

Or

- b) Describe Alpha Beta Pruning approach in brief.

18. a) Explain in detail the significance of semantics of quantifier.

Or

- b) Define Unification. Write and explain the unification algorithm.

19. a) What is Text classification ? How does it work in spam detection ? Explain.

Or

- b) Write an overview of artificial neural networks.

20. a) What do you know about a prolog meta-interpreter ? Explain with an example.

Or

- b) i) What is the difference between Association List and Hash Table ? Explain.

(5 marks)

- ii) How will you construct the Association List ? Discuss in brief.

(5 marks)

[5 × 10 = 50 marks]

D 33717

(Pages : 2)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Electronics and Communication Engineering

EC 19 703—MICROWAVE THEORY AND TECHNIQUES

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. Give a description on bunching process.
2. List the limitations of conventional active devices at microwave frequency.
3. Explain the basic working of a Magnetron oscillator.
4. Write short notes on scattering matrix and its properties.
5. Describe Faraday rotation.
6. What is a passive microwave device ? Give few examples.
7. Explain the structure of PIN diode with a neat diagram.
8. What is a varactor diode ? List its few applications.
9. Write a short note on HEMT.
10. What is a frequency meter ?
11. How is return losses measured with a reflectometer ?
12. How can dielectric constant of a solid be measured ?
13. What is doppler frequency ?
14. What is delay line canceller ?
15. Write notes on non - coherent radar.

(10 × 5 = 50 marks)

Turn over

Part B

*Answer any **one** question from each module*

16. In detail, explain about velocity modulation, power output and efficiency of a Klystron Oscillator.

Or

17. Describe the operation and structure of a TWT.

18. Explain the operation of direction couplers and also explain its S- matrix.

Or

19. Explain the operation and working principle of microwave circulator.

20. Explain the various modes of operation of a Gunn effect diode.

Or

21. Explain in detail, the structure and operation of MESFET.

22. How can insertion loss and attenuation be measured ?

Or

23. Detail on how microwave power measurement is done ?

24. Explain CW radar and CW radar with non- zero IF.

Or

25. With a neat block diagram, explain radar transmitter and receiver.

(5 × 10 = 50 marks)

D 33712

(Pages : 2)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)
EXAMINATION, NOVEMBER 2022**

Electrical and Electronics Engineering
EE 19 703—DIGITAL SIGNAL PROCESSING

Time : Three Hours

Maximum : 100 Marks

Part A

Answer any ten questions.

Each question carries 5 marks.

- I. 1 Using FFT algorithm, compute the DFT of $x(n) = \{2, 2, 2, 2, 1, 1, 1, 1\}$.
- 2 Differentiate between DIF and DIT.
- 3 Draw the flow graph of a 4 point DFT by applying radix-2 DIT-FFT algorithm.
- 4 How do you analyze in selecting the type of filter (IIR/FIR) for an application ?
- 5 Implement the following system function by applying cascade form.

$$H(z) = \frac{1}{(1 + 2z^{-1})(1 - z^{-1})}$$

- 6 Explain how an analog filter maps into a digital filter in Impulse Invariant transformation.
- 7 Discuss about the pass band and stop band characteristics of Butterworth filter.
- 8 Point out the limitation of using rectangular window in FIR filter design.
- 9 Give Hamming window function.
- 10 Explain Multirate signal processing.
- 11 Outline the process of sampling rate conversion.
- 12 State the applications of multirate signal processing.
- 13 Summarize the factors that influence selection of DSP processor for an application.
- 14 Compare fixed point arithmetic and floating point arithmetic.
- 15 List the advantages and applications of DSP.

(10 × 5 = 50 marks)

Turn over

Part B*Answer any five questions*

- II. 1 Determine the response of LTI system when the input sequence is $x(n) = \{-1, 1, 2, 1, -1\}$ using radix 2 DIF FFT. The impulse response is $h(n) = \{-1, 1, -1, 1\}$.

Or

- 2 Compute the eight point DFT of the sequence $x = [1, 1, 1, 1, 1, 1, 1, 1]$, using Decimation-in-Frequency FFT algorithm.
- 3 Realize the following using cascade and parallel

$$H(z) = \frac{3 + 3.6z^{-1} + 0.6z^{-2}}{1 + 0.1z^{-1} - 0.2z^{-2}}$$

Or

- 4 Draw the direct form I and direct form II structures for the given difference equation $y(n) = y(n-1) - 0.5y(n-2) + x(n) - x(n-1) + x(n+2)$.

- 5 Convert the analog filter with system function $H_a(s) = \frac{s + 0.1}{(s + 0.1)^2 + 9}$ into a digital IIR filter by means of the impulse invariance method.

Or

- 6 Using rectangular window technique design a LPF with pass band gain of unity, cut-off frequency of 1000 Hz and working sampling frequency of 5 kHz. The length of impulse is 7.
- 7 Explain in detail about decimation and interpolation.

Or

- 8 Explain the sampling rate conversion by a rational factor and derive the input and output relation in both time and frequency domain
- 9 Draw and explain the architecture of TMS320C67x processor.

Or

- 10 Explain few applications of digital signal processor with suitable example.

 $(5 \times 10 = 50 \text{ marks})$

D 33731

(Pages : 3)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Printing Technology

PT 19 702—QUALITY CONTROL AND STANDARDIZATION

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. Differentiate between the Dot size comparator and Twenty step tone scale and vignettes
2. How to determine the specifications for the printing production process ? Explain.
3. Explain the effect of the following on dot gain :
 - a) Solid ink density ; and
 - b) Paper properties.
4. Explain the application and design of a GATF/RHEM light indicator.
5. How does an offset printer control the ink color and film thickness throughout the print ? Explain the target used for this task.
6. What is the significance of having an information block in the GATE test forme ? Explain.
7. How do you select the right control strip for quality print production ?
8. What are the factors that affect the selection of the ink sequence in four-color printing ? Explain in detail.
9. In a production line of sheet fed coating machine, the average number of non-conformities per coating machine is estimated to be 45. The quality engineer wishes to establish a C chart for this operation, using an inspection unit of 6 sheet fed coating machines. Find the 3 sigma limits for this chart.
10. What is the rule for positioning print control strips in a sheet ? Discuss.
11. Briefly explain IT 8.7/3 Basic Data Set used in characterization of a Printing press.

Turn over

12. Explain the various elements of a print control strip.
13. A printer wishes to see the effect of different dot shapes on the print quality, printed on different grades of papers. In such case which test target is more suitable? Discuss the characteristics of such test targets.
14. What is the specialty of the Dot size comparator test target? Explain in detail.
15. In a production line of sheet fed coating machine, the average number of non-conformities per coating machine is estimated to be 45. The quality engineer wishes to establish a C chart for this operation, using an inspection unit of 5 sheet-fed coating machines. Find the 3 sigma limits for this chart.

(10 × 5 = 50 marks)

Part B*Answer one full question from each section.**Each question carries 10 marks.*

16. Explain the purpose and functions of a GATF test chart.
Or
17. List the different test images used for monitoring print attributes and explain the method of analyzing them.
18. The following data were collected from a process manufacturing offset rubber rollers. The quality characteristic under study was roller diameter with sample size 6. Construct a X bar and R chart for the data using the moving range method and determine if the process of roller manufacturing is in control or not?

Lot No	:	1	2	3	4	5	6	7	8	9	10
Average Roller diameter	:	53	58	54	55	58	53	57	55	56	54

Lot No	:	11	12	13	14	15	16	17	18	19	20
Average Roller diameter	:	55	53	52	55	50	55	56	52	55	57

Or

19. Explain the four different types of color proofs
20. Which test target is more suitable to analyze the dot reproduction in highlight and shadow areas of an offset plate image carrier? Explain its design.

Or

21. The following data were collected from a process manufacturing offset rubber blankets. The quality characteristic under study was blanket hardness with sample size 6. Construct a X bar and R chart for the data using moving range method and determine if the process of roller manufacturing is in control or not ?

Lot No	:	1	2	3	4	5	6	7	8	9	10
Average blanket hardness	:	53	58	54	55	58	53	57	55	56	54

Lot No	:	11	12	13	14	15	16	17	18	19	20
Average blanket hardness	:	55	53	52	55	50	55	56	52	55	57

22. A quality inspection was carried out for 20 lots of weekly magazines, by selecting 25 magazines for each lot. The table gives the number of defects found in each lot under test. Plot a fraction defective chart and determine if the process is in control or not ? If not, revise the control limits and give your conclusions :

Magazine Lot Number	:	1	2	3	4	5	6	7	8	9	10
Number of defects found	:	2	10	7	6	12	5	4	9	12	2

Magazine Lot Number	:	11	12	13	14	15	16	17	18	19	20
Number of defects found	:	12	14	1	13	14	12	4	6	7	10

Or

23. Explain the design and evaluation of the following test charts of the GATF Test forme :

- Transfer grids ; and
- Color correction Target.

24. Construct a fraction defective chart for the following data and find whether the process is in control or not. Revise the limits if found out of control :

SI. No	:	1	2	3	4	5	6	7	8	9	10
No of samples	:	200	230	212	223	248	246	265	234	213	233
No of defectives	:	10	8	4	6	2	12	8	9	5	7

Or

25. How do you evaluate grey balance using Gray balance test chart ? Explain the procedure in detail.

(5 × 10 = 50 marks)

D 33726

(Pages : 3)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Mechanical Engineering
ME 19 702—MACHINE DESIGN—II

Time : Three Hours

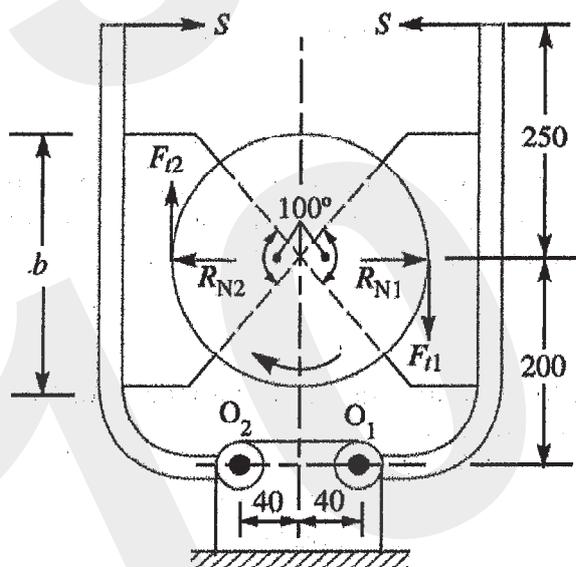
Maximum : 100 Marks

*Answer all questions.
Each question carries 20 marks.*

1. (a) A multi-disk clutch consists of steel and bronze plates. It transmits 15 kW power at 1400 r.p.m. The inner and outer diameters of the contacting surfaces are 100 and 200 mm. respectively. The co-efficient of friction is 0.15 and the permissible intensity of pressure is 0.5 N/mm^2 . Assuming uniform wear theory, calculate the number of steel and bronze disks.

Or

- (b) A double shoe brake, as shown in Fig. is capable of absorbing a torque of 1400 Nm. The diameter of the brake drum is 350 mm and the angle of contact for each shoe is 100° . If the co-efficient of friction between the brake drum and lining is 0.4 ; find : (a) The spring force necessary to set the brake ; and (b) The width of the brake shoes, if the bearing pressure on the lining material is not to exceed 0.3 N/mm^2 .



All dimensions in mm.

Turn over

2. (a) A 50 kW motor running at 1000 r.p.m. is required to drive a water pump pulley at 400 r.p.m. Motor pulley diameter is limited to 0.36 m. Center distance is to be around 2.5 m. Select a suitable V-belt and design the drive.

Or

- (b) A bucket elevator is to be driven by a geared motor and a roller chain drive with the information given below :

Motor output – 3 kW

Speed - 100 r.p.m.

Elevator drive shaft speed – 42 r.p.m.

Load – even

Distance between centres of sprockets approximately – 1.2 m.

Period of operation - 16 hours/day

Geared motor is mounted on an auxiliary bed for centre distance adjustments. Design a chain drive.

3. (a) Select a suitable deep groove ball bearing for a drilling machine spindle of 40 mm. diameter. Radial load is 2 kN. Thrust is 1.5 kN. Spindle speed is 3,000 r.p.m. Desired life is 3000 hrs.

Or

- (b) Design a journal bearing for a centrifugal pump with the following data. Diameter of the journal = 150 mm. ; Load on bearing = 40 kN ; Speed of journal = 900 r.p.m.

4. (a) Design a pair of spur gears to transmit 20 kW at a pinion speed of 1800 r.p.m. The gear runs at 600 r.p.m. Selecting suitable materials, determine the dimensions of the gears

Or

- (b) A hardened steel worm rotates at 1440 r.p.m. and transmits 12 kW to a phosphor bronze gear. The speed of the worm gear should be 60 rpm. Design the worm gear drive if an efficiency of atleast 82 % is desired.

5. (a) Determine the dimensions of cross-section of the connecting rod for a diesel engine with the following data :

Cylinder bore = 100 mm.

Length of connecting rod = 350 mm.

Maximum gas pressure = 4 MPa.

Factor of safety = 6.

Or

- (b) With neat diagrams, explain the design recommendations for welded assemblies.

D33721

(Pages : 2)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Information Technology

IT 19 702—COMPUTER GRAPHICS AND MULTIMEDIA

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. Illustrate about random scan display with its structure.
2. Explain DDA line drawing algorithm with an example.
3. Describe the beam penetration technique for colour display in CRT monitor.
4. Explain some of the basic 2D transformations.
5. Give any five advantages of line clipping.
6. A (-5, 3) and B (15, 9) $x_{min} = 0$, $x_{max} = 10$, $y_{min} = 0$, $y_{max} = 10$. Find the lower and upper bound of the clipped line
7. Explain the translation in 3D with suitable diagram.
8. Illustrate parallel projection with a suitable diagram.
9. Given a homogeneous point (1, 2, 3). Apply rotation 90 degree towards X,Y and Z axis and find out the new coordinate points.
10. Explain about Cel Animation and Path Animation to create animations.
11. Explain the procedure of editing digital recordings.
12. Describe about synchronization aspect ratio with respect to video.
13. Give technical description on MPEG compression.
14. Describe about storage requirement in compression.
15. Illustrate the basics of DVI.

(10 × 5 = 50 marks)

Part B

*Answer one full section from each question.
Each question carries 10 marks.*

16. a. Illustrate in detail about Bressenham's line drawing algorithm with derivation.

Or

- b. Discuss in detail about plasma panel display and draw the structure of plasma panel.

Turn over

17. a. Explain in detail about Sutherland Hodgeman polygon clipping with a suitable example.

Or

b. Illustrate and explain in detail about Flood fill algorithm.

18. a. Explain Scaling in 3D with proper matrices.

Or

b. Illustrate the concept of sweep representation in solid modelling.

19. a. Explain in detail about traditional data stream characteristics and types.

Or

b. Discuss the concept of digital video in detail.

20. a. Explain the major steps of data compression with relevant block diagram.

Or

b. Describe any two types of image frames in MPEG for compression.

(5 × 10 = 50 marks)

D 33716

(Pages : 3)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Electronics and Communication Engineering

EC 19 702—DIGITAL SYSTEM DESIGN

Time : Three Hours

Maximum : 100 Marks

Part A*Answer any ten questions.**Each question carries 5 marks.*

1. What are the data types used in VHDL ?
2. What is a concurrent signal assignment statement in VHDL ? Give an example.
3. Differentiate transport and inertial delays with an example.
4. Explain clock skew and metastability.
5. Briefly explain the rules to perform bubble to bubble logic.
6. Explain propagation delay.
7. Briefly explain the steps in analysing an asynchronous sequential circuit
8. Explain the partitioning and merging procedures in state reduction.
9. Explain the asynchronous sequential circuits.
10. Explain complex PLD.
11. Design a 2-bit magnitude comparator and implement it using a suitable PLA.
12. Differentiate the features and structures of FPGA and CPLD.
13. Explain the fault equivalence.
14. Explain the importance of digital system testing.
15. What are boundary scan standards?

(10 × 5 = 50 marks)

Turn over

Part B

Answer any **one** question from each module.

Each question carries 10 marks.

16. Write the VHDL code for a full adder in all three models.

Or

17. Write the VHDL code for a 3 bit up and down ripple carry adder in structural model.

18. Discuss the salient features of circuit timing diagram and propagation delay.

Or

19. Explain with suitable example hazards in combinational network and sequential network. Also suggest suitable schemes to eliminate them.

20. Reduce the given state table.

Present State	Next State		Out put	
	X = 0	X = 1	X = 0	X = 1
<i>a</i>	<i>f</i>	<i>b</i>	0	0
<i>b</i>	<i>d</i>	<i>c</i>	0	0
<i>c</i>	<i>f</i>	<i>e</i>	0	0
<i>d</i>	<i>g</i>	<i>a</i>	1	0
<i>e</i>	<i>d</i>	<i>c</i>	0	0
<i>f</i>	<i>f</i>	<i>b</i>	1	1
<i>g</i>	<i>g</i>	<i>h</i>	0	1
<i>h</i>	<i>g</i>	<i>a</i>	1	0

Or

21. Design a sequential circuit with two D flip-flops A and B and one input *r*. When *r* = 0 the state of the circuit remains same. When *r* = 1, the circuit goes through the state transitions from 00 to 01 and 11 to 10 back to 00 and repeats.

22. Explain the architecture of FLEX 10 K FPGA with neat diagram.

Or

23. Draw and explain the simplified block diagram of Xilinx 400 series CLB and Carry logic.

24. Explain Built In Self-Test in detail.

Or

25. Explain fault equivalence and fault dominance with suitable examples.

(5 × 10 = 50 marks)

D 33711

(Pages : 2)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)
EXAMINATION, NOVEMBER 2022**

Electrical and Electronics Engineering

EE 19 702—ELECTRICAL DRIVES

Time : Three Hours

Maximum : 100 Marks

Part A*Answer any ten questions.**Each question carries 5 marks.*

- I. 1 Explain the typical Elements of an Electric Drive.
2 Explain the speed- torque conventions used in multi quadrant operation ?
3 What are the components of load torque ? Explain.
4 Write short notes on starting of DC motor and significance of Back e.m.f.
5 Justify how armature voltage control is suitable for Constant torque applications.
6 Draw a single phase converter operated in two quadrants and explain its operation.
7 Compare the operation of VSI and CSI fed induction motor drive.
8 Write short notes on pole changing method of speed control technique.
9 Illustrate the features of variable frequency control.
10 Illustrate when a synchronous motor said to be self-controlled ?
11 Discuss the disadvantages of load commutation in the CSI fed synchronous motor drive.
12 What are the types and advantages of permanent magnet synchronous motor drives ?
13 Describe the operation of a variable reluctance stepper motor and what is micro stepping.
14 Differentiate the behaviour of variable reluctance and permanent magnet stepper motor ?
15 State the important features of traction drives.

(10 × 5 = 50 marks)

Turn over

Part B

Answer any five questions.

Each question carries 10 marks.

1. Explain the various power electronic converters used in the drives.

Or

2. Derive the mathematical condition to obtain steady state stability of equilibrium point
3. A 200 V, 10.5 A, 2000 r.p.m. shunt motor has the armature and field resistances of 0.5 and 400Ω respectively. It drives a load whose torque is constant at rated motor torque.

Calculate motor speed if the source voltage drops to 175 V

Or

4. Explain with neat block diagram of the closed loop control operation chopper based converter for controlling above and below the base speed.
5. Explain stator voltage control method of Induction motor drive and give the reason how it is suitable for fan type of load ?

Or

6. Describe the operation of Static Kramer Drive with neat diagram for obtaining constant power control.
7. Describe the self-controlled synchronous motor drives in detail and compare with the load commutated inverter controlled drives.

Or

8. Explain BLDC motor drive for speed control applications.
9. Explain the torque versus stepping rate characteristics of stepper motor.

Or

10. Compare and contrast conventional AC and DC drives.

(5 × 10 = 50 Marks)

D 33730

(Pages : 2)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)
EXAMINATION, NOVEMBER 2022**

Printing Technology

PT 19 701—ADVANCEMENT IN PRINTING TECHNOLOGY

Time : Three Hours

Maximum : 100 Marks

Part A*Answer any ten questions.**Each question carries 5 marks.*

1. Discuss the features and advantages of 3D printing.
2. Compare water-jet and laser cutters.
3. Write notes on the history of digital fabrication.
4. Explain different types of subtractive manufacturing.
5. Write notes on geometric specifications for 3D printing.
6. Define 3D printing and its development.
7. Discuss the recent developments in bio-printing.
8. Discuss about material specifications in 3D printing.
9. What are the objectives of bio-fabrication? Brief.
10. Write notes on prototyping rapid tooling.
11. What are the different softwares used in 3D printing? Brief.
12. Write notes on bio printing.
13. Explain stereo lithography.
14. Discuss the printed electronics market.
15. Write notes on organic electronics.

(10 × 5 = 50 marks)

Turn over

Part B

Answer one full question from each section.

Each question carries 10 marks.

16. With neat sketches, compare the working of laser and water-jet cutters.

Or

17. With neat diagrams, explain 3 methods used to print 3D printed objects. Discuss its advantages and limitations.

18. Discuss various processes used for rapid prototyping.

Or

19. With neat sketches, explain the following :

(a) 3D inkjet printing.

(b) Rapid manufacturing.

(b) Solid ground curing.

20. Explain various types of file formats used for additive manufacturing.

Or

21. Explain the following under additive manufacturing : Color specifications ; Texture specifications; Print constellations ; Metadata ; Compression and Distribution.

22. Discuss various factors to be considered for bio printing.

Or

23. Discuss various techniques used for cell to organ printing.

24. Explain the printing approaches for the fabrication of printed electronics.

Or

25. Discuss the applications of printed electronics and challenges of printed electronics market.

(5 × 10 = 50 marks)

D 33720

(Pages : 2)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)
EXAMINATION, NOVEMBER 2022**

Information Technology

IT 19 701—DESIGN AND ANALYSIS OF ALGORITHMS

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. What is an algorithm ? Discuss the characteristics of an algorithm.
2. Design an algorithm to compute the area and circumference of a circle.
3. Solve the given recurrence relation : $x(n) = x(n - 1) + 5$ for $n > 1$, $x(1) = 0$.
4. Explain the working of heap sort algorithm.
5. What do you mean by amortized analysis? Enumerate the techniques for performing amortized analysis.
6. What is a binary search tree ? Explain the steps involved in searching a node in binary search tree.
7. Tabulate the differences between divide and conquer method and dynamic programming.
8. Explain Huffman coding in Greedy approach.
9. Compare Prim's and Kruskal's algorithm for minimum spanning tree.
10. Elaborate the algorithmic strategy for solving a problem through branch and bound.
11. List the steps involved in solving 8-queens problem through backtracking.
12. Consider the following set of positive numbers : {1, 3, 2}. Find the subsets with sum = 3 using backtracking approach.
13. Give the algorithm for vertex cover of an undirected graph.
14. Define the terms of complexity classes : P, NP, NP-Complete and NP-Hard.
15. Explain the concept of clique decision problem in detail.

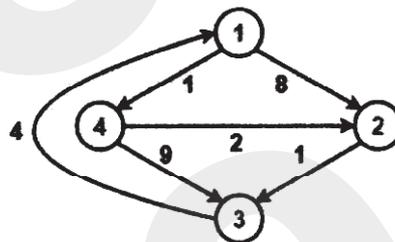
(10 × 5 = 50 marks)

Turn over

Part B

Answer **one** full section from each question.
Each question carries 10 marks.

16. (a) Discuss the asymptotic analysis of an algorithm with its notations in detail.
Or
(b) Write the linear search algorithm and analyse for its best, worst and average case time complexity.
17. (a) Demonstrate quick sort algorithm and explain the steps involved in quick sort of the given numbers : 50, 23, 9, 18, 61 and 32.
Or
(b) What is an AVL tree ? Elaborate the different rotations defined for AVL tree.
18. (a) Explain the given graph algorithms: Depth first search and Breadth first search.
Or
(b) Explain the procedure of merge sort and sort the given numbers using merge sort technique - 54, 26, 93, 17, 77, 31, 44, 55 and 20.
19. (a) Illustrate Dijkstra's algorithm to compute the shortest path of an undirected graph.
Or
(b) Using Floyd Warshall Algorithm, find the shortest path distance between every pair of vertices.



20. (a) Prove that Hamiltonian cycle problem is NP - Complete.
Or
(b) Suggest an approximation algorithm for travelling salesperson problem. Assume that the cost function satisfies the triangle inequality.

(5 × 10 = 50 marks)

D 33715

(Pages : 2)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Electronics and Communication Engineering

EC 19 701—INFORMATION THEORY AND CODING

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. Write short note on Lempel Ziv coding.
2. Differentiate self-information and mutual information.
3. Describe Shannon - Fano coding with an example.
4. What is meant by vector spaces in Galois field ?
5. What is a Group ?
6. How is Galois field calculated ?
7. Explain syndrome in linear block code.
8. Give an account of decoding of cyclic codes.
9. Explain generator matrix in linear block codes.
10. Write a note on binary primitive BCH code.
11. What is meant by non-binary BCH code ?
12. Write a short note on decoding of BCH codes.
13. Explain Tree diagram representation of convolutional codes.
14. Explain Interleaved convolutional codes.
15. Explain about generator polynomial in convolutional code.

(10 × 5 = 50 marks)

Turn over

Part B

*Answer any **one** question from each module.*

16. Define Entropy. Prove that entropy is maximum when probability of all symbols are equiprobable.

Or

17. Explain Huffman coding with an example.

18. Explain the construction and basic properties of Galois field ?

Or

19. Explain binary field arithmetic in Galois field.

20. With example, explain error detection and correction in linear block codes.

Or

21. Give an account on generator matrix and parity check polynomials in cyclic code.

22. Describe coding and decoding in Reed Solomon codes with the help of examples.

Or

23. Explain generator matrix and parity check matrix in BCH code.

24. Explain Maximum likelihood decoding in convolutional codes with necessary examples.

Or

25. With an example, explain state diagram representation of convolutional codes.

(5 × 10 = 50 marks)

D 33710

(Pages : 2)

Name.....

Reg. No.....

**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Electrical and Electronics Engineering

EE 19 701—POWER SYSTEM—III—SWITCH GEARS, PROTECTION AND UTILIZATION

Time : Three Hours

Maximum : 100 Marks

Part A*Answer any ten questions.**Each question carries 5 marks.*

- I. 1 Summarize the importance of protective schemes employed in power system.
2 Compare different types of circuit breakers.
3 Write short notes on testing of circuit breaker.
4 Differentiate static relay and magnetic relay.
5 Explain the causes of over voltages.
6 Explain the capacitive current breaking.
7 Explain how generator is protected against inter-turn fault.
8 What is meant by time graded and current graded system protection ?
9 State the application of CT's/PT's in protective scheme.
10 Classify the types of insulations.
11 Explain surge diverters.
12 What is Lightning ? Describe the mechanism of lightning discharge.
13 Discuss the requirements of electric motors for traction work.
14 Draw an equivalent circuit of an arc furnace and thereby obtain the condition for the maximum output.
15 Discuss the concept of dielectric heating.

(10 × 5 = 50 marks)

Turn over

Part B

Answer any five questions.

- II. 1 Explain the term restriking voltage. Derive an expression for the same in terms of system voltage, Inductance and Capacitance across a CB contact when a three phase fault occurs.

Or

- 2 Compose and draw the schematic of a vacuum Circuit Breaker and explain its function.

- 3 Draw the protective zone diagram for a sample network and explain its rules.

Or

- 4 Discuss the construction details and principle of operation of induction type directional over current relay.

- 5 Explain the construction and operation of differential relays, and explain how these relays are helpful in protecting generator windings.

Or

- 6 Explain in detail about differential protection of transformers with its draw back. Also mention the prevention of inrush current.

- 7 Discuss the following :

- i) Insulation Protection
- ii) Protection against lightning.

Or

- 8 Explain in detail how protection is employed against lightening.

- 9 Discuss construction and operation of induction furnace with the neat diagram.

Or

- 10 i) Discuss the method of temperature control of resistance furnaces.

- ii) Explain about high frequency power supply.

(5 × 10 = 50 marks)

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(Pages : 2)

Name.....

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**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]
EXAMINATION, NOVEMBER 2022**

Mechanical Engineering

ME 19 701—INDUSTRIAL ENGINEERING AND SYSTEMS MANAGEMENT

Time : Three Hours

Maximum : 100 Marks

Part A

*Answer any ten questions.
Each question carries 5 marks.*

1. How does industrial engineering help to increase the productivity of an organisation ?
2. What are the functions of industrial engineering ?
3. Discuss about the components of work study.
4. Write a short note on how work study helps in improving productivity.
5. What is work sampling ? What are its merits and limitations ?
6. How is the job selected for method study ?
7. Explain memo motion study with an application.
8. Write a short note on string diagram.
9. Discuss the objectives of work measurement.
10. Distinguish between value analysis and value engineering.
11. Explain the various life cycle phases through which a system evolves.
12. Narrate about systems engineering with an example.
13. Describe internal and external customers with an example.
14. What are the applications of control charts ?
15. List the steps involved in systems engineering process.

(10 × 5 = 50 marks)

Turn over

Part B

Answer all questions.

16. Enumerate in detail about preventive maintenance and breakdown maintenance.

Or

17. Explain the creative phase of Value Analysis.

18. Explain in detail about the work study step by step procedure.

Or

19. Explain multiple activity chart with the help of an example.

20. Enumerate the principles of motion economy with particular reference to workplace layout and ergonomic design of a product.

Or

21. Explain in detail about cycle graph and Chrono cycle graph.

22. Write short notes on the following :

(i) Pareto analysis.

(5 marks)

(ii) Cause and effect diagram.

(5 marks)

Or

23. Explain the types of quality costs.

24. Explain in detail about business process reengineering with an example.

Or

25. Explain in detail about QFD technique.

[5 × 10 = 50 marks]