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Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

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 Discuss the factors to be considered in the drive selection.
 - $2 \quad {\rm Describe \ the \ various \ components \ of \ electrical \ drive.}$
 - 3 Write short note on load equalisation.
 - 4 What is speed control and explain the methods of speed control of DC motors ?
 - 5 Justify how armature voltage control is suitable for Constant torque applications
 - 6 Compose the speed torque equation of single phase fully controlled converter fed separately excited DC motor.
 - 7 Explain the concept of plugging in Induction motor drive ?
 - 8 Compare the merits and demerits of voltage fed inverters controlled drives.
 - 9 Illustrate the features of variable frequency control.
 - 10 Illustrate when a synchronous motor said to be self-controlled ?
 - 11 Justify why self-controlled synchronous motor is free from hunting ?
 - 12 What are the types and advantages of permanent magnet synchronous motor drives ?
 - 13 Brief the operation of switched reluctance motor.
 - 14 Differentiate the behaviour of variable reluctance and permanent magnet stepper motor ?
 - 15 State the important features of traction drives.

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

Turn over

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Part B

Answer any **five** questions. Each question carries 10 marks.

II. 1 Label the essential parts of electric drive. Explain its function.

Or

- 2 Derive the mathematical condition to obtain steady state stability of equilibrium point.
- 3 Explain the Electrical and mechanical characteristics of commonly used electric motors.

Or

- 4 Discuss the different control techniques of chopper in detail.
- 5 Describe the four modes of operation of a static scherbius drive with neat diagram.

Or

- 6 Compose in detail about the closed loop operation of armature voltage control method with field weakening mode control in detail.
- 7 Describe briefly the power factor angle control of synchronous motors with relevant vector diagram.

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.

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SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

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 Find the 4-point DFT of the sequence $x(n) = \{1, 1\}$.
 - 2 Differentiate between DIF and DIT.
 - 3 State circular frequency shift property of DFT.
 - 4 How do you analyze in selecting the type of filter (IIR/FIR) for an application?
 - 5 Compare bilinear transformation and Impulse invariant method of IIR filter design.
 - 6 Summarize, why digital filters are more useful than analog filters ?
 - 7 Describe the characteristics of Butter worth filter.
 - 8 Distinguish the IIR and FIR filter.
 - 9 Give Hamming window function.
 - 10 Explain Multirate signal processing.
 - 11 Outline the process of sampling rate conversion.
 - 12 State the applications of muitirate signal processing.
 - 13 Summarize the factors that influence selection of DSP processor for an application.
 - 14 How does a digital signal processor differ from other processors?
 - 15 Compare fixed point and floating point processors.

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

Turn over

Part B

Answer any **five** question. Each question carries 10 marks.

II. 1 Explain the Radix 2 DIF - FFT algorithm for 8 point DFT.

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 Draw the direct form I and direct form II structures for the given difference equation

$$y(n) = y(n-1) - 0.5 y(n-2) + x(n) - x(n-1) + x(n+2).$$

Or

4 Convert the pole zero IIR filter into lattice ladder structure

$$H(Z) = \frac{1 + 2Z^{-1} + 2Z^{-2} + Z^{-3}}{1 + \frac{13}{24}Z^{-1} + \frac{5}{8}Z^{-2} + \frac{1}{3}Z^{-3}}.$$

5 Design a second order digital low pass Butterworth filter with a cut-off frequency 3.4 KHz at a sampling rate of 8 KHz using bilinear transformation.

Or

- 6 Design a length-5 FIR band reject filter with a lower cut-off frequency of 2 KHz, an upper cut off frequency of 2.4 KHz, and a sampling rate of 8000 Hz using Hamming window.
- 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 the block diagram of Harvard architecture and explain.

Or

10 Explain few applications of digital signal processor with suitable example

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SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

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 artificial neuron and biological neuron.
 - 2 Name and explain some activation functions used in ANN ?
 - 3 Compare and Contrast between supervised learning and unsupervised learning ?
 - 4 Explain the limitations of Fuzzy system?
 - 5 Illustrate any one defuzzification method with an example ?
 - 6 Explain the methods of aggregation of fuzzy rules.
 - 7 What is cardinality of a Fuzzy set ? Whether a power set can be formed for a fuzzy set ?
 - 8 Explain Centre of gravity method of defuzzification.
 - 9 Summarize Fuzzy rule and Fuzzy linqistic variable?
 - 10 State and explain the role of fitness function in Genetic Algorithm.
 - 11 Which factors attribute popularity of GA?
 - 12 Give examples to illustrate various crossover techniques.
 - 13 List few applications of support vector machines and explain any one.
 - 14 Write about swarm intelligence.
 - 15 Explain harmony search in brief.

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

Turn over

Part B

 $\mathbf{2}$

Answer any **five** questions. Each question carries 10 marks.

II. 1 Explain with a neat diagram the neural network architecture of multilayer feed forward network.

Or

2 Consider the following full counter propagation network (CPN)shown in below figure using input pair x(1, 1) y = (0, 1); perform first phase of training (One step only). Find the activation of the cluster layer units and update the weights using learning rates of 0.3.



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 Explain the features and benefits of the following Fuzzy propositions :
 - (i) Unconditional and qualified propositions ; and
 - (ii) Conditional and Unqualified propositions.

Or

6 Distinguish between mamdani and sugeno fuzzy inference systems.

7 With an example for each bring out the significance of the following as referred to Genetic Algorithm: Fitness function, Reproduction, Roulette wheel selection, Cross Over, Mutation Operator and Bitwise operators.

Or

- 8 Describe the basic steps of Genetic Algorithm used for solving optimization techniques and Compare the features of Genetic Algorithm with other optimization techniques.
- 9 With a neat flowchart, explain the algorithm of SVM.

Or

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

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SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

Electrical and Electronics Engineering

EE 19 705(F)—SWITCHED MODE POWER CONVERTERS

Time : Three Hours

Maximum: 100 Marks

Part A

Answer any **ten** questions.

- I. 1 Obtain the boundary conditions between continuous and discontinuous conduction mode of operation for (i) boost converter (ii) buck-boost converter.
 - 2 Discuss the working of a half bridge converter with relevant circuit and wave forms.
 - 3 Give a comparison of different DC to DC Converters.
 - 4 Compare current mode and voltage mode control of SMPS.
 - 5 With the help of circuit and relevant waveforms, discuss the working of push-pull converter
 - 6 Discuss the voltage mode control principles of fly back 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 How to eliminate the harmonics using bipolar PWM switching techniques ?
 - 11 Explain the concept of current controlled voltage source inverter.
 - 12 Explain a method of voltage control within the Inverter?
 - 13 What is meant by resonant converters? How are they useful in SMPC applications?
 - 14 Discuss the operation of ZVS resonant switch converters. Draw the circuit diagram 8 and relevant waveforms
 - 15 Discuss various classifications of resonant converters.

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

Turn over

Part B

Answer any **five** questions.

II. 1 Explain the working of Buck- Boost dc-dc converter in continuous conduction mode and obtain the input-output voltage and current relation as a function of duty ratio.

Or

- 2 Briefly explain the operating modes of Buck converter and deduce expression for boundary value of inductance to decide operating modes?
- 3 Explain the operation of a Flyback and forward converter with a neat circuit diagram and operational waveforms

Or

- 4 Explain in brief a) push-pull converter operation b) choice of the switching frequency of isolated switch mode converters
- 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 Explain the three phase thyristorised bridge inverter with star connected resistance load, assuming 120° mode of operation. Draw the corresponding output phase and line voltage of inverter

Or

- 8 Draw the waveforms and discuss the performance of following methods of PWM control used in inverters.
 - i) Symmetrical multiple pulse modulation.
 - ii) Sinusoidal pulse width modulation.
- 9 Explain a series loaded resonant dc-dc converter and its discontinuous mode of operation with neat figures?

Or

10 A parallel resonant dc-dc converter has Vs = 150V, Lr = 10 µ H, Cr = 0.42 µ F, RL=10_ and fs= 120 kHz. Determine the output voltage of the converter. Assume the output filter components and produce the ripple free output current and voltage.

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

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SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

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. Explain sequential processing in VHDL.
- 2. What is a concurrent signal assignment statement in VHDL ? Give an example.
- 3. Differentiate signal assignment and variable assignment with examples.
- 4. Explain clock skew.
- 5. Explain the bubble to bubble logic.
- 6. Write a short note on design procedure of combinational circuit.
- 7. Briefly explain the state assignment procedure.
- 8. Explain the partitioning procedures in state reduction.
- 9. Explain the serial adder.
- 10. Explain the structure of PAL.
- 11. Design a half adder and implement it using a suitable PLA.
- 12. Differentiate the features and structures of simple PLD and complex PLD.
- 13. Explain Ad-hoc design for testability techniques.
- 14. Explain the importance of fault location.
- 15. Explain stuck at faults.

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

Turn over

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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. Explain assert and report statements with examples.
- 18. Discuss the salient features of circuit timing diagram and propagation delay.

Or

- 19. Explain with suitable example static -1 and static -0 hazards in combinational network and sequential network. Also suggest suitable schemes to eliminate them.
- 20. Reduce the given state table.

Present	Next	State	Ou	tput	
State	X = 0	X = 1	$\mathbf{X} = 0$	X = 1	
А	В	С	0	0	
В	D	Е	0	0	
С	E	D	0	0	
D	Н	н	0	0	
E	\mathbf{l}	Н	0	0	
Н	А	А	0	0	
J	А	Α	0	1	
		Or			

- 21. Design a circuit to detect 1001 using JK flipflops.
- 22. Explain the architecture of XC9500 CPLD with neat diagram.

Or

- 23. Draw and explain the simplified block diagram of XC 4000 series CLB and Carry logic.
- 24. Explain Built In Self-Test in detail.

Or

25. Explain boundary scan architecture with neat diagram.

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

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SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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. List the limitations of conventional active devices at microwave frequency?
- 2. Draw and explain the working of reflex Klystron oscillator.
- 3. What is the power output and efficiency of a magnetron oscillator ?
- 4. Explain the term Faraday rotation.
- 5. What is meant by phase shifter ?
- 6. Give an account on the operation of microwave circulator.
- 7. What are the various modes of operation of Gunn-effect diode ?
- 8. Describe the working of Varactor diode. What are its uses ?
- 9. What is BARITT diode?
- 10. Write short notes on slotted line carriage.
- 11. Expand the term VSWR. How is it measured ?
- 12. Discuss the working of a frequency meter.
- 13. What is the Radar equation ?

Turn over

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- 14. What is a mixer ? What is its application ?
- 15. Draw the block diagram of a Radar Transmitter and explain.

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

Part B

 $\mathbf{2}$

Answer any **one** question from each module. Each question carries 10 marks.

16. In detail, explain the structure and operation of TWT.

Or

- 17. With necessary equations, explain velocity modulation and bunching process in Klystron amplifier.
- 18. Explain the operation of hybrid couplers.

Or

19. Write notes on terminations and attenuators.

20. Explain microwave BJT and HBT.

Or

- 21. Discuss the working of IMPATT diode and TRAPATT diode.
- 22. How is microwave power measurement done?

Or

- 23. With a neat block diagram, explain spectrum analyser.
- 24. Explain MTI Radar with a neat block diagram.

Or

25. Explain FM-CW Radar and FM-CW Altimeter.

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

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SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

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. Differentiate between single mode and multimode fibers.
- 2. List the advantages and disadvantages of optical fibers.
- 3. Compare dispersion shifted and dispersion flattened fibers.
- 4. Outline on shot noise.
- 5. What are coherent systems. Give examples.
- 6. Write a note on degradation due to fiber dispersion.
- 7. Draw and explain the structure of pin photodiode.
- 8. Draw and explain the structure of laser diode.
- 9. What is the concept of phase noise ?
- 10. What is an Isolator ? Explain its structure.
- 11. Explain about semiconductor amplifier.
- 12. Give an account on wavelength tunable amplifiers.
- 13. Write a short note on optical solitons.
- 14. Explain about FTH.
- 15. Write a note on AON.

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

Turn over

$\mathbf{2}$

Part B

Answer any **one** question from each module. Each question carries 10 marks.

16. Describe about step index, graded index, numerical aperture and V-number.

Or

- 17. Explain in detail about various types of dispersion and attenuation in optical fibers.
- 18. Explain about ISI and equalisation.

Or

- 19. Detail on degradation induced by non linear effects in fiber propagation.
- 20. Draw and explain the working of a PN photodiode.

Or

- 21. With necessary diagram explain the switching and modulation characteristics of an LED.
- 22. Explain about optical couplers, splitters, circulators and attenuators.

Or

- 23. Explain about Raman amplifier and Brillouin amplifier.
- 24. Explain the working of SONET/SDH.

Or

25. Describe ODTM technology and its issues.

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SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

Electronics and Communication Engineering

EC 19 705 (C)-BIOMEDICAL ELECTRONICS

Time : Three Hours

Maximum : 100 Marks

Part A

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

- 1. Explain the various parts in an ECG signal.
- 2. List and explain the different types of EEG waves.
- 3. Draw a neat block diagram of a medical man instrument system.
- 4. Write a short note on defibrillator.
- 5. Give an account on phonocardiography.
- 6. What is photoplethysmography ? What are its types ?
- 7. Explain the need of a heart lung machine.
- 8. What is the functionality of ventilator ?
- 9. Explain the functions provided by an Infant incubator.
- 10. Outline on Magnetic Resonance imaging System.
- 11. Summarize on radiation therapy and its applications.
- 12. Explain the principle of ultrasonic imaging system.
- 13. What is macro shock ? How can it be prevented ?
- 14. Explain the various chemical tests performed in clinical labs.
- 15. What is Telemedicine? What are its uses?

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

Turn over

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Part B

Answer any **one** question from each module. Each question carries 10 marks.

16. (a) With a neat diagram, explain the anatomy of human brain.

Or

- (b) Draw and explain the structure of human heart.
- 17. (a) Explain the different methods which are used for blood pressure measurement.

Or

- (b) List and explain the various lead systems in ECG. Use necessary sketches.
- 18. (a) Write notes on the following :
 - (1) Haemodialysis.
 - (2) Lithotripsy.

Or

(b) Explain in detail how EEG measurement done.

19. (a) Detail with necessary sketches about Computer Tomography.

Or

- (b) Explain any *two* applications of X-Ray in medicine.
- 20. (a) What are the various instruments in clinical labs? Explain the tests conducted on blood cells.

Or

(b) What are the physiological effects of shock ? How can it be prevented ?

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SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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. Explain in detail about Direct View Storage Tube.
- 2. Illustrate with suitable explanations about Bresenham line drawing algorithm.
- 3. Discuss about the advantages and disadvantages of Midpoint Circle Algorithm.
- 4. A (-5, 3) and B (15, 9) xmin = 0, xmax = 10, ymin = 0, ymax = 10. Find the lower and upper bound of the clipped line.
- 5. Describe about Window to Viewport coordinate Transformation.
- 6. Illustrate about Homogeneous co-ordinates.
- 7. Describe about surface rendering in 3D.
- 8. Write short note on sweep representation.
- 9. Explain about the Operations on Manifold-with-Boundary Meshes.
- 10. Discuss any five Characteristics for Continuous media.
- 11. What is Animation ? Explain the uses of Animation.
- 12. Illustrate the basic Principle of a Television.
- 13. Describe about Run length coding in Entropy coding.

Turn over

- 14. Describe the basics of Lossy Compression of JPEG.
- 15. Illustrate the basics of MPEG.

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

Part B

 $\mathbf{2}$

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

16. (a) With a neat sketch, explain about Random scan and its significance.

Or

- (b) Discuss about the Midpoint Ellipse drawing Algorithm.
- 17. (a) Explain about 2D rotation with relevant matrix and diagrams.

Or

- (b) Illustrate the steps of Algorithm involved in Weiner Atherton method for Polygon Clipping."
- 18. (a) Given a 3D object with co-ordinate points A (0, 3, 3), B (3, 3, 6), C (3, 0, 1), D (0, 0, 0). Apply the scaling parameter 2 towards X-axis, 3 towards Y-axis and 3 towards Z-axis and obtain the new coordinates of the object.

Or

- (b) Explain the significance of Euler angles in rotation with specific explanation about Pitch, Roll and Yaw rotation.
- (a) Describe in detail about the concept of Frames, Frame Rate, Resolution and Compression of videos in multimedia.

Or

- (b) Discuss about Speech synthesis and Speech Recognition in Multimedia.
- 20. (a) Explain about the basic concepts related to DVI.

Or

(b) Explain about Motion Compensation and Discrete Cosine transform in Compression.

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

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SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

Information Technology

IT 19 703—ARTIFICIAL INTELLIGENCE

Time : Three Hours

Maximum : 100 Marks

Part A

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

- 1. Differentiate uninformed and informed search strategies with suitable examples.
- 2. Briefly explain A* search strategies.
- 3. What is iterative Deepening Search ? Explain with an example.
- 4. State and explain the concepts of semantic nets.
- 5. Illustrate how a game can be formally defined as a kind of search problem using elements.
- 6. Briefly explain alpha beta pruning.
- 7. List the significance of predicate calculus.
- 8. What is Quantification ? Explain the domains in quantification.
- 9. Write and explain the resolution inference rule.
- 10. What is the purpose of Backpropagation ? Explain.
- 11. How will you measure generalization ?
- 12. List some applications of ANNs.
- 13. Explain the concepts of LISP predicates.

Turn over

- 14. Define macros. Write a simple macro named xxx, which takes a number and sets its value to 10.
- 15. Write the various advantages of LISP.

(b) Write short notes on :

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

Part B

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

16. (a) List the various steps to perform a state space search. Illustrate with an example.

Or

(i) AO* search. (ii) Best First Search.

17. (a) Outline the components and functionalities of any *two* agent programs.

Or

- (b) Illustrate how to extend the minimax idea to multiplayer games.
- 18. (a) How will you convert arbitrary well-formed formulas to clause form? Explain with an example.

Or

- (b) Explain the concept of semantics in predicate calculus.
- 19. (a) How will you acquire knowledge by skimming text ? Explain in brief.

Or

- (b) How does the back propagation algorithm work ? Explain.
- 20. (a) Explicate lambda expressions in LISP.

Or

(b) What is Prolog ? Explain the syntax and operations of prolog with an example.

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

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SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

Information Technology

IT 19 704—CLOUD COMPUTING

Time : Three Hours

Maximum : 100 Marks

Part A

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

- 1. Brief any three Cloud Computing Platforms.
- 2. How are the cloud components deployed ? Explain.
- 3. What is DaaS? Write its advantages.
- 4. List and explain the features of AJAX.
- 5. Elucidate the necessity of security in cloud.
- 6. Compare and contrast full virtualization and para virtualization.
- 7. Discuss the role of SaaS in health care services.
- 8. Explain hybrid and community cloud.
- 9. What are Thin Clients ? Explain.
- 10. State and explain the advantages of Bungee connect.
- 11. How do Microsoft windows Azure App deploy applications securely ? Discuss.
- 12. Discuss in brief the significance of presentation 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.

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

Turn over

Part B

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

- 16. Explain the following challenges in Cloud.
 - i) Data lock-in and Standardization.
 - ii) Fault tolerance and Disaster recovery.

Or

17. Explain the Cloud Service Life Cycle in detail.

18. Explain in detail about Cloud Web Hosting services.

Or

- 19. How are browsers handled in the cloud ? Explain the different protocols in detail.
- 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. What is the need for Virtualization How is Virtualization achieved in the cloud ? Explain in detail the pros and cons of virtualization.
- 24. Explain in detail the various cloud services available for individuals.

Or

25. Illustrate with an example the possibility to integrate cloud platforms and mid markets.

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

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(5 marks)

(5 marks)

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SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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. Enumerate the characteristics of learning in hand writing recognition and robot driving problems.
- 2. State the limitations of machine learning.
- 3. Define Version space. Give List-Then-Eliminate algorithm in learning.
- 4. Explain the process of roulette wheel selection in detail.
- 5. Mention the characteristics of problems solved by back propagation networks.
- 6. Give the algorithm for gradient descent for training a linear unit.
- 7. Explain minimum description length principle in detail.
- 8. Elaborate the concept of naive Bayesian classifier.
- 9. Define error of a hypothesis and show it in graphical form.
- 10. Write short notes on K nearest neighbour algorithm.
- 11. Explain the role of radial basis functions in machine learning.
- 12. Give the procedure for the derivation of locally weighted linear regression.
- 13. State the terminologies of literal, ground literal, positive and negative literal with example.

Turn over

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- 14. Explain the generation of candidate specialization in FOIL.
- 15. Enumerate the difficulties in-inductive logic-programming.

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

Part B

 $\mathbf{2}$

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

16. (a) Elaborate the applications of machine learning in detail.

Or

- (b) Illustrate the representation of a decision tree with example.
- 17. (a) Briefly describe the applications of genetic algorithms.

Or

- (b) Illustrate the algorithm of back propagation networks with diagram.
- 18. (a) Summarize the derivation of *k*-means algorithm in detail.

Or

- (b) Explain the sample complexity for infinite hypothesis space in detail.
- 19. (a) Discuss briefly about training and classification of K nearest neighbour algorithm.

Or

- (b) Summarize the concepts of instance based learning methods.
- 20. (a) Give the pseudocode of Leam-One-Rule algorithm.

Or

(b) Enumerate the differences between inductive and analytical learning and explain the algorithm of PROLOG-EBG.

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

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SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

Mechanical Engineering

ME 19 702—MACHINE DESIGN—II

Time : Three Hours

Maximum : 100 Marks

Each question carries 20 marks.

(a) A multi-disk clutch consists of two steel disks with one bronze disk. The inner and outer diameters of the contacting surfaces are 200 and 250 mm. respectively. The co-efficient of friction is 0.1 and the maximum pressure between the contacting surfaces is limited to 0.4 N/mm². Assuming uniform wear theory, calculate the required force to engage the clutch and the power transmitting capacity at 720 r.p.m.

Or

(b) A double shoe brake, as shown in Fig. 1 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 coefficient of friction between the brake drum and lining is 0.4; find : 1. the spring force necessary to set the brake ; and 2. the width of the brake shoes, if the bearing pressure on the lining material is not to exceed 0.3 N/mm².



All dimensions in mm.

Turn over

D 113627

 (a) Design a V-belt drive for transmitting 1.5 kW from a motor running at 1450 r.p.m. to a blower at 300 r.p.m. in an air conditioning plant. The center distance should be atleast 1.5 times the diameter of the larger pulley. Diameter of the motor pulley is 300 mm.

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) A single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3 kN. The shaft rotates at 1200 r.p.m. The expected life of the bearing is 20000 hrs. The minimum acceptable diameter of the shaft is 75 mm. Select a suitable ball bearing for this application.

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) In a spur gear drive for a stone crusher, the gears are made of C40 steel. The pinion is transmitting 30 kW at 1200 r.p.m. The gear ratio is 3. Gear is to work 8 hours per day, six days a week and for 3 years. Design the drive

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 r.p.m. Design the worm gear drive if an efficiency of atleast 82 % is desired.

D 113627

5. (a) Determine the dimensions of cross-section of connecting rod for a high speed I.C. engine using the following data :

Cylinder bore = 125 mm. Length of connecting rod = 300 mm. Maximum gas pressure = 3.5 MPa. Length of stroke = 125 mm. Mass of reciprocating parts = 1.6 kg. Engine speed = 2200 r.p.m. Factor of safety = 5

Assume suitable data and state the assumptions you make.

Or

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

D 113628

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Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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) Hysteresis error. (ii) Range and span.
 - (iii) Resolution.

(2 + 2 + 1 = 5 marks)

- 2. Explain the construction and working of any one type of accelerometer used to measure vibration.
- 3. Describe the working of absolute encoders.
- 4. With neat sketch, explain the construction and working of a telescopic cylinder.
- 5. Brief on the working of a needle type of flow control valve.
- 6. With a circuit diagram, explain the basic components of a pneumatic system.
- 7. Brief on any *five* advantages of the volume booster.
- 8. Explain the working of a flapper nozzle.
- 9. Describe the purpose of bellow and LVDT in a PI convertor.

(2 + 3 = 5 marks)

- 10. Discuss the working of hydrodynamic bearings.
- 11. Brief on any five advantages of implementing adaptive control in CNC machine tools.
- 12. With a block diagram, describe the major elements of a PLC.

Turn over

- 13. Compare brush and brushless DC motors with respect to speed range, control, noise, rotor inertia and life.
- 14. Explain the working of a harmonic drive.
- 15. Describe the working of laser range finder.

Part B

Answer **all** questions. Each question carries 10 marks.

16. With neat sketches, explain the construction and working of inductive and capacitive type of proximity sensors.

(5 + 5 = 10 marks)

(5 + 5 = 10 marks)

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

Or

- 17. Elaborate on the working of : (i) Synchros ; and (ii) Resolvers.
- 18. With an industrial example, illustrate the construction and working of an unloading valve.

Or

- 19. Illustrate the construction and working of an external gear motor.
- 20. Elaborate on Pneumatic Integral controller as applied to a pneumatic self-balancing mechanical system.

Or

- 21. Illustrate the construction and working of an IP converter.
- 22. Elaborate on the working of a recirculating ball screw mechanism.

Or

- 23. Citing industrial examples, explain the elements of open loop and closed loop systems.
- 24. What are mathematical models ? Explain the building blocks of electrical systems.

Or

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

 $[5 \times 10 = 50 \text{ marks}]$

D 113629

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Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

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. Discuss briefly about automobile chassis and its subsystems with a neat sketch.
- 2. List any *five* merits of petrol injection systems.
- 3. Explain the working of a single plate diaphragm clutch with a suitable sketch.
- 4. Explain the working of Fluid coupling with neat sketch.
- 5. Describe the torque tube type propeller shaft with the help of a neat sketch.
- 6. Why are stub axles fitted in front axles ? Sketch reversed Reversed Elliot and Reversed Lemoine type stub axles.
- 7. Discuss the classification of vehicle brakes from different considerations.
- 8. Explain construction of Antilock Braking System (ABS) with neat sketch.
- 9. Explain the construction of wire wheel with a neat sketch.
- 10. Describe re-circulating ball type steering gear with a suitable sketch.
- 11. Briefly explain the construction and working of torsion bar suspension system.
- 12. Write short notes on solenoid switch used in automotive starting system.
- 13. List the benefits of parallel configuration of hybrid electric vehicle.
- 14. Classify stratified charge engines base on fuel injection and positive ignition.
- 15. Mention *any* five types of fuel cells.

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

Turn over

Part B

 $\mathbf{2}$

Answer any **one** question from each module. Each question carries 10 marks.

16. Explain the construction of various frames used in automobiles with a neat sketch.

Or

- 17. Explain D-MPFI and L-MPFI with suitable diagrams.
- 18. Describe the construction and working of a synchromesh gear box with the help of a sketch.

Or

- 19. Explain different types of rear axles with neat sketches.
- 20. Draw a schematic layout of air brake system and explain the working principle of brake valve with a sketch.

Or

- 21. Explain the construction of conventional and tubeless tyres with suitable sketches.
- 22. Explain the following terms with suitable sketches :
 - (i) Camber;
 - (ii) Caster;
 - (iii) King pin inclination ; and
 - (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. Classify stratified charge engines base on fuel injection and positive ignition. Write short notes on Texaco combustion process.

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

D 113631

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Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

Mechanical Engineering

ME 19 705 (D)-MICRO AND NANO-MANUFACTURING

Time : Three Hours

Maximum : 100 Marks

Part A

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

- 1. Explain specific applications where MEMS technology has made a significant impact in various industries.
- 2. Define micro mechatronics and highlight its significance in the development of micro scale robotic systems.
- 3. What is Micro-energy and Chemical System(MECS), and how does it contribute to the development of micro-scale power sources?
- 4. Define mechanical micromachining and explain its significance in precision manufacturing.
- 5. How does die geometry influence the quality and precision of the extruded product in micro extrusion?
- 6. Explain the characteristics of micro drilling tools, including materials and geometries.
- 7. Describe the setup and components involved in WAIMM.
- 8. Explain the Role of Water in Improving Cutting Efficiency and Reducing Heat Generation.
- 9. Briefly explain the principles of Wire Electrical Discharge Machining at the micro scale.
- 10. Define Micro and Nano Finishing Processes.
- 11. Briefly discuss about polishing performance of MR Jet Machine.
- 12. Write about Magnetorheological abrasive and its characteristics.

Turn over

- 13. Briefly describe about the challenges in micro and nano measurement.
- 14. Briefly explain the Laser Beam Micro Welding and its applications.
- 15. Describe the principle and working of confocal microscope.

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

Part B

Answer **all** the questions. Each question carries 10 marks.

 (a) Discuss the challenges and solutions in achieving precision in micro drilling for various materials.

Or

- (b) Explain the role of sacrificial layers in surface micromachining and their impact on the final device structure.
- 17. (a) Explain the micro drilling process, highlighting the differences from conventional drilling at larger scales.

Or

- (b) Identify and describe the types of tools used in micro drilling. How do these tools differ from those used in macro-scale drilling ?
- 18. (a) With a neat sketch, describe the components and working of a Micro ECM setup.

Or

- (b) Discuss how electron beams are utilized for material removal and Describe the components and setup of a Micro EBM system.
- 19. (a) Discuss how Magnetorheological Finishing (MRF) contributes to achieving high precision in micro and nano finishing processes.

Or

(b) Explain the fundamental working principle of Elastic Emission Machining. How does elastic emission contribute to the material removal process in EEM?

20. (a) Provide a description of Scanning Electron Microscopy, emphasizing the principles of electron beam interaction with samples.

Or

3

(b) Explain the principles of Scanning White-light Interferometry in micro and nanoscale measurements.

D 113633

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Name.....

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SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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. Write the significance of a Vignette Target in detail.
- 2. Explain how much it may cost to implement ISO in an organization.
- 3. With neat diagram explain the role of star targets in the evaluation of print quality.
- 4. According to you, in an organization, who is responsible for quality ?
- 5. Explain the application and design of a GATF/RHEM light indicator.
- 6. Samples of n = 8 items each are taken from a manufacturing process at regular intervals. A quality characteristic is measured and x bar and R values are calculated for each sample. After 100 lots we have, $\Sigma xi = 3000$ and $\Sigma Ri = 450$. Assume that the quantity characteristic is normally distributed. Compute control limits for the x bar and R chart.
- 7. In a quality testing process 8 samples were taken from for every hour. The \bar{x} and R values for a particular quality characteristic are determined. After 35 lots of quality test the calculated values for average of $\bar{x} = 120$ and average of R = 14.56.
 - (a) What will be the control limits for \overline{x} and R charts?
 - (b) Assume that the process is normally distributed. If the specifications are 119±5, what are your conclusions regarding the process?
- 8. 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.

Turn over

- 9. Define the term "Print density" and explain the procedure of measuring print density.
- 10. What is the specialty of a Dot size comparator test target ? Explain in detail.
- 11. Control charts were maintained on the tensile strength of a Parchment paper. After 35 lots, with sample size n = 6, the following data was obtained.

 $\Sigma \overline{x} = 1287$ and $\Sigma R = 135$

- (a) Compute control limits on the R and X bar charts and plot the graphs.
- (b) Determine whether the process is in control or not?
- 12. Explain the applications of twenty step tone scale in GATF test form.
- 13. What are the factors to be considered while deriving the specifications for printing production process ? Explain.
- 14. Explain the various elements of a print control strip.
- 15. What are the factors that affect the selection of ink sequence in four-color printing ? Explain in detail.

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

Part B

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

16. Discuss the quality cost categories and their inter relationship in detail.

Or

- 17. Explain the following attributes, that influence print characteristic.
 - (a) Substrate. (b) Grey balance.
 - (c) Tone transfer.
- 18. Explain ISO 9000 series of standards.

Or

19. How do ISO 9000 is benefitted to an organisation ? Explain.

20. Explain the following test targets : (a) Line resolution Target ; (b) Star Target

Or

- 21. How do you evaluate grey balance using Gray balance test chart? Explain the procedure in detail.
- 22. Discuss the quality cost categories and their inter relationship in detail

Or

- 23. 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.
- 24. Explain the effect of followings on print characteristics : (a) Ink density and hue ; (b) Secondary and tertiary color.

Or

25. Discuss the quality cost categories and their inter relationship in detail.

D 113634

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Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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. Explain the importance of plant layout.
- 2. Explain the procedure to determine the printing plant area requirement.
- 3. Explain the features of 5 types of shallow foundations.
- 4. What are the symptoms of a bad layout ? Brief.
- 5. Discuss the features of the circular flow pattern.
- 6. What are the essentials of layout ? Discuss.
- 7. Write notes on vibration free mounting requirements.
- 8. Discuss the facility specification for the finishing section.
- 9. Explain the importance of maintaining a record of material performance.
- 10. With neat sketches, explain the 2 types of pulleys.
- 11. Write notes on fork trucks and pallets.
- 12. How can you achieve control during paper handling ? Discuss.
- 13. Write notes on the working of the liver roller humper stacker.

Turn over

577175

- 14. Discuss automatic feeding devices for elevators.
- 15. Write notes on slat chain conveyors.

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

Part B

 $\mathbf{2}$

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

16. Explain the 3 most essential elements of a printing plant layout.

Or

- 17. What are the features to be considered for the Machinery factor in a layout ? Explain.
- 18. Discuss the features and specifications required for the following support services ;
 - (a) Shipping. (b) Warehouse storage.
 - (c) Ink mixing, storage, and pumping.

Or

- 19. Discuss the structural requirements of foundations.
- 20. What are the factors to be considered for the warehouse and storage of materials ? Explain.

Or

- 21. Discuss the facility specifications for the Sheet-fed offset room.
- 22. What are the specifications required to purchases substrates ? Explain how to test each of them.

Or

- 23. What are the specifications required to purchases plate ? Explain the inspection of each of them.
- 24. With neat sketches, explain the construction and applications of the following elevating equipments :
 - (a) Continuous motion vertical conveyers.
 - (b) Stackers.

Or

25. With neat sketches, explain the following 4 types of industrial jacks used for lifting devices.

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

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Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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. Explain the significance of the human factor in maintenance.
- 2. What is the role of computers in maintenance ? Briefly explain.
- 3. Describe reconditioning and explain its principles.
- 4. Distinguish between reciprocating and rotary compressors.
- 5. Write notes on transport machines.
- 6. Explain the maintenance of pre-press production rooms.
- 7. Discuss the importance of lubrication.
- 8. Explain the painting marks used for lubricating points on machines.
- 9. Discuss the need for the replacement of lubricants.
- 10. Explain the features of microswitches.
- 11. Discuss how inspecting incoming materials helps in quality control.
- 12. What are the factors to be considered while selecting bearings?
- 13. Explain the advantages and disadvantages of belt drives.
- 14. Discuss bearing failure.
- 15. Write notes on the maintenance of gears.

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

Turn over

(5 marks)

(5 marks)

(5 marks)

Part B

 $\mathbf{2}$

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

- 16. a) Discuss various maintenance and equipment forms.
 - b) Discuss the functions and objectives of the maintenance department.

Or

- 17. Explain different types of maintenance.
- 18. Discuss press maintenance.

Or

- 19. Discuss the erection procedure for various machines.
- 20. a) What are the lubrication instructions to be given to machine operators? Discuss. (5 marks)
 - b) Write notes on the regeneration of used oils.

Or

- 21. Explain the features of various lubricants with examples.
- 22. Discuss electromagnets and their applications in printing machines.

Or

- 23. Compare the 2 types of compressed air systems.
- 24. Discuss different types of pulleys.

Or

25. Write notes on types and maintenance of gears.

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SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

Printing Technology

PT 19 705 (C)-PACKAGING SCIENCE

Time : Three Hours

Maximum : 100 Marks

Part A

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

- 1. Discuss various markings used on packages.
- 2. Discuss the importance of the drop test along with its testing procedure.
- 3. With neat sketches, compare folding cartons and corrugated boards.
- 4. Compare three side and four side seal pouches with examples.
- 5. With neat diagram, explain the features of stand-up pouch.
- 6. What are the factors to be considered while designing barcodes ?
- 7. Compare dielectric and magnetic heat-sealing methods.
- 8. Discuss the features and applications of remoistenable glue.
- 9. What are the optical properties of plastics tested for packaging applications ?
- 10. What are the features of antimicrobial packaging ? Explain.
- 11. Write notes on oxygen scavenging packaging.
- 12. Discuss the future trends in food packaging.
- 13. What are the factors affecting the shelf life of a cosmetic product ? Discuss.
- 14. Write notes on requisites of packaging materials for hazardous chemicals.
- 15. Discuss the applications and features of aerosol packaging.

(10 പ്ര 5 = 50 ഞ്ഞ്ക്എെൺഫ)

Turn over

577177

Part B

 $\mathbf{2}$

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

16. Discuss various materials used for packaging.

Or

- 17. Discuss various tests done on packages.
- 18. With neat sketches, explain the features of various styles of pouches.

Or

- 19. Explain the features of SCS barcode and its printing.
- 20. Discuss various thermal properties of packaging substrates.

Or

- 21. Discuss 5 types of heat sealing methods.
- 22. Explain the working mechanism and applications of time-temperature indicator and gas concentration indicator.

Or

- 23. Discuss various types of active food packaging systems available.
- 24. Explain the features of various materials used for the packaging of hazardous chemicals.

Or

25. Compare blister and strip packaging along with its advantages and disadvantages

D 113638

(**Pages : 2**)

Name.....

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SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

Printing Technology

PT 19 705 (D)—GREEN PRINTING

Time : Three Hours

Maximum : 100 Marks

Part A

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

- 1. Identify the toxic and reactive wastes in offset press.
- 2. Explain the pollution prevention strategies for adhesive binding.
- 3. List all the input materials used in the flexo printing industry for flexible packaging and their impact on the environment.
- 4. What is rock paper ? How is it prepared ?
- 5. What are characteristic wastes ? Explain.
- 6. What are the benefits of vegetable oil based inks over solvent based inks?
- 7. What is anicolor printing ? Explain.
- 8. What are the benefits and environmental impact of anti-setoff spray powder ? Brief.
- 9. Explain the method of paper conditioning in printing presses.
- 10. Describe sustainable digital printing.
- 11. Discuss the environmental impact of Gravure printing industries.
- 12. How do your reduce VOC in printing industry ? Give some examples to illustrate.
- 13. Discuss 3R implementation in any printing industry with examples
- 14. What are the modifications made in ISO 14001 : 2015 over ISO 14000 : 2004 ?
- 15. How does the digitization of press helps in improving the environment?

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

Turn over

Part B

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

- 16. a) Illustrate the following with relevant example from printing industry and mention their advantages :
 - i) Countercurrent rinsing.
 - ii) Drip board.

Or

- b) What is cleaner production (CP) ? How is it different from pollution prevention ? With the requirements of CP, give some examples that help implement CP.
- 17. a) What is the purpose of "Isopropyl alcohol (IPA)" in fountain solution ? Explain the impact of IPA on environment and suggest alternative(s).

Or

- b) Explain the different alternative sources of raw materials for paper making.
- 18. a) Determine the environmental impact of toners and cartridges used for digital printing. Suggest and justify three different means to overcome these impacts.

Or

- b) What are the modifications needed in offset printing to improve the Environmental Sustainability.
- 19. a) What is the purpose of "Isopropyl alcohol (IPA)" in fountain solution ? Explain the impact of IPA on environment and suggest alternative(s).

Or

- b) How do we reduce VOC from printing industries ? Explain.
- 20. a) What is Life Cycle Assessment? Taking an example of printed product of your choice, analyze the Life Cycle stages of the product with the environmental aspects in each stage.

Or

b) Illustrate the EMS implementation in printing industry with a help of PDCA cycle.

D 113611

(**Pages : 2**)

Name	 ••••••	•••••	

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

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 Discuss the factors to be considered in the drive selection.
 - $2 \quad {\rm Describe \ the \ various \ components \ of \ electrical \ drive.}$
 - 3 Write short note on load equalisation.
 - 4 What is speed control and explain the methods of speed control of DC motors ?
 - 5 Justify how armature voltage control is suitable for Constant torque applications
 - 6 Compose the speed torque equation of single phase fully controlled converter fed separately excited DC motor.
 - 7 Explain the concept of plugging in Induction motor drive ?
 - 8 Compare the merits and demerits of voltage fed inverters controlled drives.
 - 9 Illustrate the features of variable frequency control.
 - 10 Illustrate when a synchronous motor said to be self-controlled ?
 - 11 Justify why self-controlled synchronous motor is free from hunting ?
 - 12 What are the types and advantages of permanent magnet synchronous motor drives ?
 - 13 Brief the operation of switched reluctance motor.
 - 14 Differentiate the behaviour of variable reluctance and permanent magnet stepper motor ?
 - 15 State the important features of traction drives.

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

Turn over

D 113611

Part B

Answer any **five** questions. Each question carries 10 marks.

II. 1 Label the essential parts of electric drive. Explain its function.

Or

- 2 Derive the mathematical condition to obtain steady state stability of equilibrium point.
- 3 Explain the Electrical and mechanical characteristics of commonly used electric motors.

Or

- 4 Discuss the different control techniques of chopper in detail.
- 5 Describe the four modes of operation of a static scherbius drive with neat diagram.

Or

- 6 Compose in detail about the closed loop operation of armature voltage control method with field weakening mode control in detail.
- 7 Describe briefly the power factor angle control of synchronous motors with relevant vector diagram.

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.

D 113616

(**Pages : 2**)

Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) [2019 SCHEME] DEGREE EXAMINATION, NOVEMBER 2024

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. Explain sequential processing in VHDL.
- 2. What is a concurrent signal assignment statement in VHDL ? Give an example.
- 3. Differentiate signal assignment and variable assignment with examples.
- 4. Explain clock skew.
- 5. Explain the bubble to bubble logic.
- 6. Write a short note on design procedure of combinational circuit.
- 7. Briefly explain the state assignment procedure.
- 8. Explain the partitioning procedures in state reduction.
- 9. Explain the serial adder.
- 10. Explain the structure of PAL.
- 11. Design a half adder and implement it using a suitable PLA.
- 12. Differentiate the features and structures of simple PLD and complex PLD.
- 13. Explain Ad-hoc design for testability techniques.
- 14. Explain the importance of fault location.
- 15. Explain stuck at faults.

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

Turn over

D 113616

2

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. Explain assert and report statements with examples.
- 18. Discuss the salient features of circuit timing diagram and propagation delay.

Or

- 19. Explain with suitable example static -1 and static -0 hazards in combinational network and sequential network. Also suggest suitable schemes to eliminate them.
- 20. Reduce the given state table.

Present	Next	State	Ou	tput	
State	X = 0	X = 1	$\mathbf{X} = 0$	X = 1	
А	В	С	0	0	
В	D	Е	0	0	
С	E	D	0	0	
D	Н	н	0	0	
E	\mathbf{l}	Н	0	0	
Н	А	А	0	0	
J	А	Α	0	1	
		Or			

- 21. Design a circuit to detect 1001 using JK flipflops.
- 22. Explain the architecture of XC9500 CPLD with neat diagram.

Or

- 23. Draw and explain the simplified block diagram of XC 4000 series CLB and Carry logic.
- 24. Explain Built In Self-Test in detail.

Or

25. Explain boundary scan architecture with neat diagram.

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

D 113622

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Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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. Explain in detail about Direct View Storage Tube.
- 2. Illustrate with suitable explanations about Bresenham line drawing algorithm.
- 3. Discuss about the advantages and disadvantages of Midpoint Circle Algorithm.
- 4. A (-5, 3) and B (15, 9) xmin = 0, xmax = 10, ymin = 0, ymax = 10. Find the lower and upper bound of the clipped line.
- 5. Describe about Window to Viewport coordinate Transformation.
- 6. Illustrate about Homogeneous co-ordinates.
- 7. Describe about surface rendering in 3D.
- 8. Write short note on sweep representation.
- 9. Explain about the Operations on Manifold-with-Boundary Meshes.
- 10. Discuss any five Characteristics for Continuous media.
- 11. What is Animation ? Explain the uses of Animation.
- 12. Illustrate the basic Principle of a Television.
- 13. Describe about Run length coding in Entropy coding.

Turn over

- 14. Describe the basics of Lossy Compression of JPEG.
- 15. Illustrate the basics of MPEG.

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

Part B

 $\mathbf{2}$

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

16. (a) With a neat sketch, explain about Random scan and its significance.

Or

- (b) Discuss about the Midpoint Ellipse drawing Algorithm.
- 17. (a) Explain about 2D rotation with relevant matrix and diagrams.

Or

- (b) Illustrate the steps of Algorithm involved in Weiner Atherton method for Polygon Clipping."
- 18. (a) Given a 3D object with co-ordinate points A (0, 3, 3), B (3, 3, 6), C (3, 0, 1), D (0, 0, 0). Apply the scaling parameter 2 towards X-axis, 3 towards Y-axis and 3 towards Z-axis and obtain the new coordinates of the object.

Or

- (b) Explain the significance of Euler angles in rotation with specific explanation about Pitch, Roll and Yaw rotation.
- (a) Describe in detail about the concept of Frames, Frame Rate, Resolution and Compression of videos in multimedia.

Or

- (b) Discuss about Speech synthesis and Speech Recognition in Multimedia.
- 20. (a) Explain about the basic concepts related to DVI.

Or

(b) Explain about Motion Compensation and Discrete Cosine transform in Compression.

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

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Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

Mechanical Engineering

ME 19 702—MACHINE DESIGN—II

Time : Three Hours

Maximum : 100 Marks

Each question carries 20 marks.

(a) A multi-disk clutch consists of two steel disks with one bronze disk. The inner and outer diameters of the contacting surfaces are 200 and 250 mm. respectively. The co-efficient of friction is 0.1 and the maximum pressure between the contacting surfaces is limited to 0.4 N/mm². Assuming uniform wear theory, calculate the required force to engage the clutch and the power transmitting capacity at 720 r.p.m.

Or

(b) A double shoe brake, as shown in Fig. 1 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 coefficient of friction between the brake drum and lining is 0.4; find : 1. the spring force necessary to set the brake ; and 2. the width of the brake shoes, if the bearing pressure on the lining material is not to exceed 0.3 N/mm².



All dimensions in mm.

Turn over

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 (a) Design a V-belt drive for transmitting 1.5 kW from a motor running at 1450 r.p.m. to a blower at 300 r.p.m. in an air conditioning plant. The center distance should be atleast 1.5 times the diameter of the larger pulley. Diameter of the motor pulley is 300 mm.

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) A single-row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3 kN. The shaft rotates at 1200 r.p.m. The expected life of the bearing is 20000 hrs. The minimum acceptable diameter of the shaft is 75 mm. Select a suitable ball bearing for this application.

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) In a spur gear drive for a stone crusher, the gears are made of C40 steel. The pinion is transmitting 30 kW at 1200 r.p.m. The gear ratio is 3. Gear is to work 8 hours per day, six days a week and for 3 years. Design the drive

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 r.p.m. Design the worm gear drive if an efficiency of atleast 82 % is desired.

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5. (a) Determine the dimensions of cross-section of connecting rod for a high speed I.C. engine using the following data :

Cylinder bore = 125 mm. Length of connecting rod = 300 mm. Maximum gas pressure = 3.5 MPa. Length of stroke = 125 mm. Mass of reciprocating parts = 1.6 kg. Engine speed = 2200 r.p.m. Factor of safety = 5

Assume suitable data and state the assumptions you make.

Or

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

D 113633

(Pages : 3)

Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME) EXAMINATION, NOVEMBER 2024

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. Write the significance of a Vignette Target in detail.
- 2. Explain how much it may cost to implement ISO in an organization.
- 3. With neat diagram explain the role of star targets in the evaluation of print quality.
- 4. According to you, in an organization, who is responsible for quality ?
- 5. Explain the application and design of a GATF/RHEM light indicator.
- 6. Samples of n = 8 items each are taken from a manufacturing process at regular intervals. A quality characteristic is measured and x bar and R values are calculated for each sample. After 100 lots we have, $\Sigma xi = 3000$ and $\Sigma Ri = 450$. Assume that the quantity characteristic is normally distributed. Compute control limits for the x bar and R chart.
- 7. In a quality testing process 8 samples were taken from for every hour. The \bar{x} and R values for a particular quality characteristic are determined. After 35 lots of quality test the calculated values for average of $\bar{x} = 120$ and average of R = 14.56.
 - (a) What will be the control limits for \overline{x} and R charts?
 - (b) Assume that the process is normally distributed. If the specifications are 119±5, what are your conclusions regarding the process?
- 8. 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.

Turn over

- 9. Define the term "Print density" and explain the procedure of measuring print density.
- 10. What is the specialty of a Dot size comparator test target ? Explain in detail.
- 11. Control charts were maintained on the tensile strength of a Parchment paper. After 35 lots, with sample size n = 6, the following data was obtained.

 $\Sigma \overline{x} = 1287$ and $\Sigma R = 135$

- (a) Compute control limits on the R and X bar charts and plot the graphs.
- (b) Determine whether the process is in control or not?
- 12. Explain the applications of twenty step tone scale in GATF test form.
- 13. What are the factors to be considered while deriving the specifications for printing production process ? Explain.
- 14. Explain the various elements of a print control strip.
- 15. What are the factors that affect the selection of ink sequence in four-color printing ? Explain in detail.

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

Part B

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

16. Discuss the quality cost categories and their inter relationship in detail.

Or

- 17. Explain the following attributes, that influence print characteristic.
 - (a) Substrate. (b) Grey balance.
 - (c) Tone transfer.
- 18. Explain ISO 9000 series of standards.

Or

19. How do ISO 9000 is benefitted to an organisation ? Explain.

20. Explain the following test targets : (a) Line resolution Target ; (b) Star Target

Or

- 21. How do you evaluate grey balance using Gray balance test chart? Explain the procedure in detail.
- 22. Discuss the quality cost categories and their inter relationship in detail

Or

- 23. 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.
- 24. Explain the effect of followings on print characteristics : (a) Ink density and hue ; (b) Secondary and tertiary color.

Or

25. Discuss the quality cost categories and their inter relationship in detail.