D 123975 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Mechanical Engineering

ME 19 803 (C)—INDUSTRIAL SAFETY ENGINEERING

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Narrate any *two* factors which reduce accidents in a machine shop.
2. Briefly discuss about prevention causes and cost of accident.
3. Define industrial safety engineering and importance of safety.
4. Briefly discuss about " Cumulative Trauma Disorders".
5. Elaborate about ergonomics hazards.
6. Briefly discuss about nature and cause of Industrial hazards.
7. Elaborate about safety audit.
8. What are the various control measures against human error ?
9. Briefly explain role of management in industrial safety.
10. How do you classify the dangerous materials with pictorial symbol ?
11. Briefly discuss about safe limit of amperages.
12. How do you control the fire hazards ?
13. Briefly explain the safety provisions under The Workmen compensation Act -1923.
14. Elaborate about the safety provisions under The Factory Act 1948.
15. Briefly discuss about the safety provisions under The Maharashtra Factory Rule 1963.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. a) What accident reporting ? Explain how it helps in preventing accidents.

Or

b) Write short notes on :

(i) Accident investigation and prevention ; and (5 marks)

(ii) Responsibility of safety. (5 marks)

17. a) Discuss the steps involved to identify and assess hazardous noise in workplace environment.

Or

b) Explain the role of Safety Education and training in Industry.

18. a) Explain the role of safety committee and role of government in industrial safety.

Or

b) Discuss about the various role of preventive maintenance in safety and health.

19. a) Write short notes on the following :

(i) Control of chemical hazard ; and (5 marks)

(ii) Control of physical hazard. (5 marks)

Or

b) Discuss about control and industrial fire protection system.

20. a) Discuss the public liabilities Insurance act 1991.

Or

b) Explain the safety previsions under the mine act 1952.

[5 × 10 = 50 marks]

D 123961 Pages: 2 Name:

Reg. No :

EIGHTH SEMESTER B.TECH(ENGINEERING) DEGREE[2019 SCHEME]

EXAMINATION, APRIL 2025

619260

MECHANICAL ENGINEERING

ME 19 801 - COMPUTER INTEGRATED MANUFACTURING

Time: Three Hours **Maximum: 100 Marks**

PART A: Answer any Ten questions.

Each question carries five marks **(10 X 5 = 50 marks)**

1.	Briefly explain the scope of CIM.
2.	What are the various elements and applications of CIM?
3.	Briefly discuss about CAD and CAM.
4.	Compare NC with CNC.
5.	What is meant by absolute programming method?
6.	List any 5 M Code used in manual part programming.
7.	Name the two methods of Computer Aided Process Planning
8.	What are the different levels of coding system?
9.	What are different methods of grouping parts into part families?
10.	Write short notes on various materials handling equipment that are commonly found in a FMS.
11.	Write the significance of work envelope.
12.	Classify the robot as per the type of control and mobility.
13.	Name the types of accuracy specifications used for CMM.
14.	Mention the advantages of CAT .
15.	List the advantages of non-contact inspection methods.

PART B: Answer one full section from each question.

Each question carries 10 marks **(5 X 10 = 50 marks)**

16.	a.	With a neat sketch, explain the DBMS architecture
		OR
	b.	Write the fifteen principles of product development.
17.	a.	With a neat sketch explain the components of open-loop control system.
		OR
	b.	Explain the various types of errors which are commonly occurring when you are writing a program in CNC machines
18.	a.	With a neat sketch, explain the variant retrieval process planning.

		OR	
	b.	With a neat sketch, discuss about multi class coding classification system.	619260
19.	a.	Distinguish between FMC and FMS	
		OR	
	b.	Briefly explain the following terms: (i) Payload (2.5) (ii) Compliance (2.5) (iii)Precision (2.5) (iv)Accuracy (2.5)	
20.	a.	Describe the various steps involved in measurement in CMM.	
		OR	
	b.	Write detailed notes on Computer Aided Inspection (CAI) and discuss the needs.	

D 123974 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Mechanical Engineering

ME 19 802—OPERATIONS MANAGEMENT

Time : Three Hours Maximum : 100 Marks

Part A

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

1. What are the factors affecting forecasting ?
2. What advantages as a forecasting tool does exponential smoothing have over moving averages ?
3. What are the types of demand pattern ? Explain them with suitable sketches.
4. List five major criteria for buying a product.
5. What are the factors affecting plant location ?
6. Write the significance of proto type while developing a new product.
7. ABC Industry needs 25,000 units/year of a bought out component which will be used in its main product. The ordering cost is Rs. 150 per order and the carrying cost per unit per year is 20 % of the purchase price per unit which is Rs. 100. Determine (a) Economic order quantity ; (b) Number of orders per year ; and (c) Time between successive orders.
8. Distinguish between ABC and VED analysis.
9. Discuss the significance of safety stock in inventory management.
10. Distinguish between sequencing and scheduling.
11. What is a work breakdown structure, and how is it useful for project planning ?
12. Depict the role and responsibility of purchase manager.
13. What are the factors for replacing equipment ?
14. Explain the trade-off in network crashing.
15. Distinguish between CPM and PERT.

(10 × 5 = 50 marks)

Turn over

Part B

Answer **all** *questions.*

16. The sales particular of a company for 13 years of operation is furnished in table 1. (a) Fit a simple regression for the above data ; and (b) Forecast the sales for the 14th year of operation :

Table 1

Year	:	1	2	3	4	5	6	7	8	9	10	11	12	13
Sales	:	96	116	119	127	146	145	153	158	160	165	177	190	205

Or

17. Discuss different types of production systems with suitable examples.

18. Explain in detail about group technology and its implication in cellular manufacturing system.

Or

19. Discuss the role of materials handling systems in improving the productivity of a company.

20. Explain in detail about master production scheduling with an example.

Or

21. Explain in detail about ABC and VED analyses.

22. Explain in detail about the Johnson's rules for sequencing with an example.

Or

23. Explain in detail about the different aspect of purchase management

24. Explain in detail about preventive and breakdown maintenance with an example.

Or

25. Find the critical path and calculate the slack time for the network shown in Figure 1.

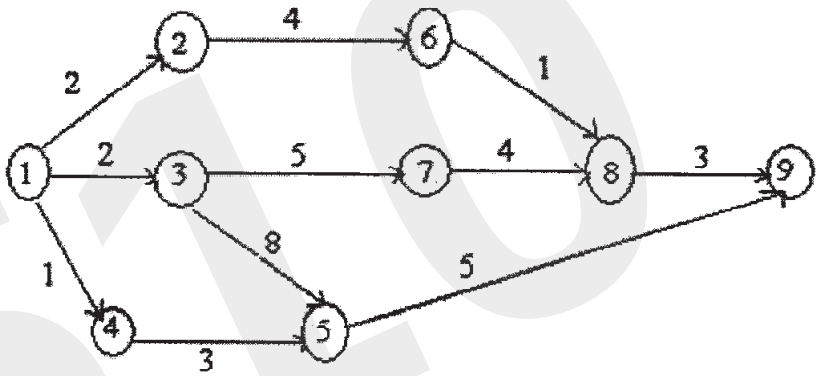

Figure 1

(5 × 10 = 50 marks)

D 123976 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Mechanical Engineering

ME 19 804 (A)—RENEWABLE ENERGY TECHNOLOGY

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Brief discuss about renewable energy scenario at national and international level.
2. Which renewable energy source is the best ? Why ?
3. Briefly explain the disadvantages of conventional energy sources.
4. Elaborate about solar irradiance.
5. Write the difference between beam radiation and diffuse radiation.
6. Briefly explain the advantages of wind power.
7. Elaborate the applications of bio mass.
8. What is Biomass energy ? Discuss about the relative merits and demerits.
9. Briefly discuss the various components of fluidized bed.
10. Brief on the concept of geothermal energy generation.
11. Briefly explain about the various methods of tidal energy generation.
12. Elaborate about the Ocean thermal energy conversion (OTEC) cycle.
13. Elaborate about global warming.
14. Briefly discuss about Acid rain.
15. Briefly explain any *five* air pollutants and their effects.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. a) Discuss the various types of renewable energy available in India.

Or

b) Explain the working principle of nuclear power plant with a neat sketch.

17. a) Describe the working principle of Pyranometers with a neat sketch.

Or

b) Draw a neat sketch of solar flat plate collector and explain its working principle.

18. a) Explain about the various types and uses of Biomass. Discuss about their merits and demerits.

Or

b) Explain any *one* type of FBC with a neat sketch.

19. a) Describe working of open cycle OTEC system with the help of a neat sketch.

Or

b) With a neat sketch, explain the working of Fuel Cell. Discuss the relative merits and demerits.

20. a) Discuss the various types of control measures to prevention of air pollution.

Or

b) With a suitable example, explain about Water pollution.

(5 × 10 = 50 marks)

D 123978 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Printing Technology

PT 19 803 (C)—PUBLISHING SCIENCE

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Write a short note on publishing science.
2. Write a short note on the electronic medium of publishing.
3. Explain the responsibilities of a graphic designer and publicist in the publishing industry.
4. Write the difference between reference publishing and publishing textbooks for children.
5. Explain the duties and responsibilities of the production manager.
6. Explain the duties of a sales manager in the publishing industry.
7. Write a short note on proofreading.
8. Explain the unsolicited manuscript with an example.
9. Write a short note the process of editing educational material.
10. Explain how will you choose news for publication.
11. Explain the given types of leads - Quotation lead, Contrast lead.
12. Write a short note about the board meeting.
13. Explain the process of subbing of mufossil copy.
14. Write a note on the process of news subbing of letters to editors.
15. Explain various styles of languages.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. Explain the structure of production department of publication house in detail.

Or

17. Explain various print media.

18. Compare the responsibilities of commissioning editor and desk editor.

Or

19. Define Publishing. Explain the difference between educational publishing and general publishing.

20. Define page makeup. Explain the various elements of page makeup used for magazine.

Or

21. Explain the various editorial techniques.

22. Explain various types of news values.

Or

23. With the help of an example, explain the elements of the News report.

24. Explain solicited and unsolicited manuscripts with examples.

Or

25. Explain the various techniques of language.

(5 × 10 = 50 marks)

D 123978 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Printing Technology

PT 19 803 (C)—PUBLISHING SCIENCE

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Write a short note on publishing science.
2. Write a short note on the electronic medium of publishing.
3. Explain the responsibilities of a graphic designer and publicist in the publishing industry.
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8. Explain the unsolicited manuscript with an example.
9. Write a short note the process of editing educational material.
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14. Write a note on the process of news subbing of letters to editors.
15. Explain various styles of languages.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. Explain the structure of production department of publication house in detail.

Or

17. Explain various print media.

18. Compare the responsibilities of commissioning editor and desk editor.

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21. Explain the various editorial techniques.

22. Explain various types of news values.

Or

23. With the help of an example, explain the elements of the News report.

24. Explain solicited and unsolicited manuscripts with examples.

Or

25. Explain the various techniques of language.

(5 × 10 = 50 marks)

D 123960 Pages : 2 Name:
Reg. No. :

EIGHTH SEMESTER B.TECH (ENGINEERING) DEGREE [2019 SCHEME]

619258

EXAMINATION, APRIL 2025

PRINTING TECHNOLOGY

PT 19 801 – PRINT MANAGEMENT, COSTING AND ESTIMATION

TIME: 3 hrs **Max. Marks 100**

Part A

Answer any 10 questions. Each question carries 5 marks.

1. What are the important Management functions? Briefly Explain.
2. Briefly explain the different types of business.
3. How print marketing is done? Briefly explain.
4. Explain the need for HRM in printing industry.
5. Employment policy is important for any industry - Justify
6. What is job evaluation? Briefly explain.
7. Why cost accountancy is required?
8. Give the advantages of cost accounting.
9. What is meant by overhead cost?
10. Give the scope of print estimation.
11. What is the general qualification of an estimator?
12. How costing is different from estimating?
13. Give any five conventional paper size
14. Why allowance for wastage should be provided?
15. Give the wastage allowance table, which is generally considered.

(10x5=50 marks)

Part B

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

16. Explain the management principles with example.

Or

17. Write a business plan for printing business

18. Differentiate between journal and ledger and also give the rules for journalizing

Or

19. Give the format of balance sheet and income statement

20. How to apportion the overhead cost? Explain with an example

Or

21. Explain the concept of cost analysis and elements of cost with example

22. What is meant by production standard and budgeted hour rate in printing industry? Explain

Or

23. Explain the estimator's working environment.

24. Calculate the quantity of black ink required for 25,000 copies of a 16 page booklet of A5 size each page with a print area of 200 cm^2 . There are 10 pages printed in black ink with halftone and 6 pages in type matter in black. The booklet is printed by offset process on a coated art paper

Or

25. Estimate the quantity of ink required in kilograms for 30,000 copies of a sheet of label, 20 labels to view per sheet with each label having a print area 179 x 194 mm printed on one side of a high gloss coated paper. The process of printing is photo-offset and the label are printed in 4 color halftone picture.

(4x10=40 marks)

D 123977 **(Pages : 3)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Printing Technology

PT 19 802—SECURITY PRINTING

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Discuss the various printing processes used for MICR numbering.
2. Differentiate between pressure sensitive label hologram and stamping holograms.
3. List the important factors that decide the right printer for barcode numbering.
4. Discuss any *two* security features produced using Intaglio and offset printing processes.
5. Explain the importance and working of metameric ink security feature.
6. Explain the printing and working principle of scrambled images security feature.
7. Explain the structure of a barcode. What are the factors that affect barcode readability ?
8. Discuss any *four* applications of holograms in product security.
9. Differentiate between chemical reactant and planchette security features.
10. Explain the working of a Barcode scanner with a schematic diagram.
11. Explain the role dry offset printing process in security printing industry.
12. Explain the role of security grade papers in security products.
13. Explain the printing and working principle of scrambled images security feature.
14. Explain any *two* optical security features developed to counteract duplication by photo-copier.
15. Explain any *two* covert security features used in bank currency.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. Explain the printing and working principle of followings in security printing :

    a) Split ink fountain ;

    b) Fusion Screen ;

    c) UV Ghost water mark ; and

    d) Infra-Red black ink Barcode printing.

Or

17. Compare the advantages and disadvantages of following printing processes for security printing

    a) Inkjet printing ; and

    b) Screen Printing.

18. Explain following printing processes for barcode printing with their advantages and disadvantages

    a) Direct thermal printing ;

    b) Thermal transfer printing ; and

    c) Laser Printing.

Or

19. Explain the following security features :

    a) Colored security fibers ; and

    b) Fluorescent security fibers

20. Explain the following security features that are used in bank cheque :

    a) Fugitive ink ; and

    b) Visible fluorescent ink

Or

21. Explain the production process of hologram making in detail.

22. Discuss the following security features :

    a) See through register ;

    b) Invisible fluorescent ink ; and

    c) Engraved portraits.

Or

23. Explain the printing techniques used for following security features :

    a) Aqua bleed security inks ;

    b) Thermo-chromic ink ; and

    c) Photochromic ink.

24. Compare the following types of holograms :

    a) 3D Single and Multiple Channel Rainbow Holograms ;

    b) Holographic Stereogram ; and

    c) Multiple Plane Rainbow Holograms.

Or

25. Explain the design, printing and security features offered by followings inks against counterfeiting

    a) Penetrating ink ;

    b) Copy / void feature ; and

    c) Coin reactive inks.

(5 × 10 = 50 marks)

D 123980 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Information Technology

IT 19 804 (E)—CYBER SECURITY

Time : Three Hours Maximum : 100 Marks

Part A

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

1. What is port scanning ? Give two examples.
2. Write short notes on vulnerability issues in the cyberspace.
3. How are real time traffic probed ? Discuss.
4. Compare network sniffers and network spoofers.
5. What is hping used for ? How is it different from Ettercap.
6. Explain the advantages of WinRelay.
7. Discuss the role of an intrusion detection system.
8. Explain the role of a packet filter.
9. What are the types of firewall available? Explain.
10. Give any two examples of Zed Attack Proxy.
11. Write short notes on bruteforce attack.
12. Compare and contrast W3af and Nikto.
13. How does a hacker initiate the computer attack ? Discuss.
14. Discuss the concept of an attack vector.
15. How are contaminants handled ? Explain.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. a) What is a Port ? List the common open ports that are vulnerable. Explain in detail the port identification service with an example.

Or

b) i) Brief the framework of OpenVAS. (5 marks)

ii) Write short notes on banner check. (5 marks)

17. a) Explain in brief the concept of Network Reconnaissance.

Or

b) i) Compare Netcat and Socat with suitable examples. (5 marks)

ii) Explain the significance of Wireshark and Etthercap in traffic management. (5 marks)

18. a) i) Explain the various types of firewalls and its advantages in detail. (5 marks)

ii) Compare and contrast Linus firewall and Windows firewall. (5 marks)

Or

b) Describe the requirements and characteristics of Virtual Private Networks.

19. a) Discuss any *two* tools that are used for scanning web vulnerabilities.

Or

b) Explain in detail the various password cracking and brute force tools.

20. a) i) Explain the various types of computer crimes in detail. (5 marks)

ii) Write short notes on Attack vectors. (5 marks)

Or

b) Discuss in brief the vision of the Indian IT ACT 2020.

[5 × 10 = 50 marks]

D 123979 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Printing Technology

PT 19 804 (A)—NEWSPAPER AND PERIODICAL PUBLISHING

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Compare the role of cartoonists and artists.
2. Explain the role of city editors in a newspaper organization.
3. What are the characteristics of Print Media ? Discuss.
4. How do you count headlines ?
5. Write notes on the following parts of a magazine :
   i) Content page ;
   ii) Running pages ; and
   iii) Color pages.
6. Define News and explain it briefly.
7. Explain the importance of graphics or diagrams in a newspaper.
8. Discuss the beat system.
9. Write notes on gathering the news.
10. Discuss the features of a professional magazine.
11. Write notes on the writer-editor relationship.
12. What are the factors influencing the layout and design of periodical publishing ? Brief.
13. Write notes on processing photographs.

Turn over

14. Explain various types of typefaces.

15. Write notes on the press and the law of libel.

(10 × 5 = 50 marks)

Part B

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

16. With the help of a flow chart, explain the organizational structure of the newspaper industry.

Or

17. Explain different ways of marketing and distribution of newspaper.

18. Discuss about technical and manuscript editing.

Or

19. Compare editing conference proceeding and a successful journal.

20. Explain various parts of a newspaper.

Or

21. Explain the basic approach for creating a graphic design.

22. What are the differences between magazine and newspaper ? Explain.

Or

23. Discuss on financial aspects of a new journal.

24. Explain various media liabilities and legal aspects in journalism.

Or

25. Discuss various types of digital right management.

(5 × 10 = 50 marks)

D 123972 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Information Technology

IT 19 803 (E)—SOFTWARE QUALITY MANAGEMENT

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Explain the software process assessment model.
2. Discuss the significance of statistical process control.
3. Write short notes on total quality management
4. List and explain the requirements of the test phase.
5. What are the various baselines needed for a software process.
6. Explain the process of configuration audit.
7. What are the various benefits of standardization ? Brief the same.
8. Explain the Malcolm Baldrige Award.
9. Write short notes on CMM model.
10. Discuss the importance of test reporting in brief. ”
11. What are the characteristics of quality measurement criteria ? Explain.
12. Explain the basic principles of real time testing.
13. Discuss in brief software defects and its types.
14. What kind of management capabilities are needed to assess defects?
15. What are the effects of software process change ?

(10 × 5 = 50 marks)

Turn over

Part B

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

16. a) i) How is the quality cost of a software estimated ? Explain. (5 marks)

ii) Write short notes on Quality Assurance Plan. (5 marks)

Or

b) Explain in detail the Business Process Re-Engineering process.

17. a) i) Explain in brief the principles and requirements of a SCM. (5 marks)

ii) How is a requirement phase build ? Explain. (5 marks)

Or

b) Briefly discuss the significance and need of automated tools. Explain with an example.

18. a) i) Explain in detail the guidelines for ISO 9000. (5 marks)

ii) Compare and contrast CMM and SPICE. (5 marks)

Or

b) i) Describe the benefits of establishing standards. (5 marks)

ii) State and explain the types of reviews for building effective standards. (5 marks)

19. a) Discuss the significance of test tools and test methods. Also. Elaborate the quality management paradigm.

Or

b) Explain in detail the techniques for establishing a software quality program.

20. a) Explain the strategies for managing resistance to software process changes ? Explain its effects and counter measures.

Or

b) Consider any automation industry. Establish and provide the various defect preventive mechanisms to be incorporated to develop a sustainable software process.

[5 × 10 = 50 marks]

D 123964 Pages: 2 Name:

Reg. No.

EIGHTH SEMESTER B.TECH(ENGINEERING) DEGREE[2019 SCHEME]

619259

EXAMINATION, APRIL 2025

INFORMATION TECHNOLOGY

IT 19 801 - CRYPTOGRAPHY AND NETWORK SECURITY

Time: Three Hours **Maximum: 100 Marks**

PART A: Answer any ten questions. Each question carries 5 marks

1. Differentiate active and passive attacks.
2. What is authentication service? Mention two authentication services defined in X.800.
3. Elaborate the working of Playfair cipher.
4. Describe Fiestal networks in cryptography.
5. Tabulate the differences between confusion and diffusion techniques.
6. Explain the significance of S-boxes in DES.
7. Specify the role of prime numbers in number theory.
8. Highlight the key components of public key encryption scheme.
9. List the benefits of Elliptic Curve Cryptography.
10. Explicate the operation of MD5 in detail.
11. Enumerate the types of replay attacks.
12. Discuss in detail about Pretty Good Privacy.
13. Give an overview of web security threats.
14. Explain in detail about Honeypots in intrusion detection.
15. What is a firewall? List its limitations.

(10 x 5 = 50 marks)

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

16. a. Illustrate the working of rail fence cipher with example.

Or

16. b. Write briefly about transposition Cipher with a relevant example.

17. a. Enumerate the principles of symmetric key cryptography and its applications.

Or

17. b. Describe the operation of equivalent inverse cipher with diagram.

18. a. Discuss briefly about the timing attacks and countermeasures to be taken in RSA algorithm.

Or

18. b. List and explain the applications of Extended Euclidean algorithm in cryptography.

19. a. Briefly discuss about X.509 authentication services.

Or

19. b. Explain the significance of Secure Electronic Transactions in online payments and e-commerce.

20. a. Explain the types of firewalls with its advantages and disadvantages in detail.

Or

20. b. What is malicious software? Discus the various types of malicious software in detail.

(5 x 10 = 50 marks)

D 123971 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Information Technology

IT 19 802—FOUNDATION OF DATA SCIENCE

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Enumerate various tasks that are done by a data scientist.
2. Highlight the benefits and challenges of data science.
3. Explain in detail about data security.
4. How do you deal with missing data in a dataset that have been collected ?
5. State the measures in data cleaning process with text data.
6. Elaborate the methods of data transformation.
7. Explain the five-number summary of boxplot.
8. Differentiate skewness and kurtosis.
9. Enumerate the uses of pivot table in data science.
10. What is regression analysis ? State the reasons for using regression analysis.
11. Describe briefly about residual plots in regression.
12. Specify the characteristics of prediction analytics in data science.
13. Define Generalization error with its formula.
14. Explain the problem of overfitting and underfitting.
15. State the usage of ridge regression in prediction.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. Discuss the role of data science in recent applications.

Or

17. Explain the common threats to data security and give the best practices for improving data security.

18. Summarize the importance of data pre-processing in data science.

Or

19. A group of 12 price records has been sorted as follows : 5, 10, 11, 13, 15, 35, 50, 55, 72, 92, 204, 215. Partition the data into three bins by each of the following methods :

    i) Equal-frequency partitioning. (3 marks)

    ii) Equal-width partitioning. (3 marks)

    iii) Clustering. (4 marks)

20. Explicate the significance of exploratory data analytics and give technical description on heatmaps.

Or

21. Explain the concept of ANOVA in detail.

22. Give the importance of data visualization and explain the types of data visualization charts in detail.

Or

23. Explain the role of data science in decision making.

24. Explain the metrics to evaluate the performance of a classifier in detail.

Or

25. What is grid search ? Explain the testing of multiple parameters using grid search.

(5 × 10 = 50 marks)

D 123973 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Information Technology

IT 19 804 (D)—NATURAL LANGUAGE PROCESSING

Time : Three Hours Maximum : 100 Marks

Part A

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

1. List the applications of natural language processing.
2. Mention the different levels of language representations.
3. Give the types of NLP systems in detail.
4. Differentiate lexical and syntactic ambiguity.
5. Explain briefly about parsing the grammar with features.
6. Enumerate the differences between top down and bottom up parsing.
7. What is semantic analysis ? Mention the critical elements of semantic analysis.
8. Represent the sentence, "Every student takes atleast one course" in logical form.
9. Explain scope ambiguities in detail.
10. Describe the relationship between syntax and semantics.
11. Mention the challenges faced by NLP models in today's world.
12. Explain the role of lexicons in NLP.
13. What are some common methods for reasoning with knowledge ?
14. Enumerate the limitations associated with knowledge representation and reasoning systems.
15. Highlight the pros and cons of frame representation.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. Explain the concept of evaluating language understanding systems in detail.

Or

17. Write briefly about the organisation of natural language processing systems.

18. Describe the role of parsing in natural language processing.

Or

19. Perform top down parsing for the sentence "John likes Richard" using the grammar given below :

$S \rightarrow NP\ VP$
$NP \rightarrow PN$
$VP \rightarrow V\ NP$

20. Explain the representation of logical form of a language.

Or

21. Discuss the ambiguities test for verb senses with an example.

22. Explain the morphological rules with semantic interpretation.

Or

23. Briefly discuss the concepts and applications of lexical semantics of NLP.

24. Summarize the techniques of knowledge representation.

Or

25. Describe the issues in quantifying natural language for knowledge representation.

(5 × 10 = 50 marks)

D 123973 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Information Technology

IT 19 804 (D)—NATURAL LANGUAGE PROCESSING

Time : Three Hours Maximum : 100 Marks

Part A

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

1. List the applications of natural language processing.
2. Mention the different levels of language representations.
3. Give the types of NLP systems in detail.
4. Differentiate lexical and syntactic ambiguity.
5. Explain briefly about parsing the grammar with features.
6. Enumerate the differences between top down and bottom up parsing.
7. What is semantic analysis ? Mention the critical elements of semantic analysis.
8. Represent the sentence, "Every student takes atleast one course" in logical form.
9. Explain scope ambiguities in detail.
10. Describe the relationship between syntax and semantics.
11. Mention the challenges faced by NLP models in today's world.
12. Explain the role of lexicons in NLP.
13. What are some common methods for reasoning with knowledge ?
14. Enumerate the limitations associated with knowledge representation and reasoning systems.
15. Highlight the pros and cons of frame representation.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. Explain the concept of evaluating language understanding systems in detail.

Or

17. Write briefly about the organisation of natural language processing systems.

18. Describe the role of parsing in natural language processing.

Or

19. Perform top down parsing for the sentence "John likes Richard" using the grammar given below :

$S \rightarrow NP\ VP$
$NP \rightarrow PN$
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21. Discuss the ambiguities test for verb senses with an example.

22. Explain the morphological rules with semantic interpretation.

Or

23. Briefly discuss the concepts and applications of lexical semantics of NLP.

24. Summarize the techniques of knowledge representation.

Or

25. Describe the issues in quantifying natural language for knowledge representation.

(5 × 10 = 50 marks)

D 123966 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Electrical and Electronics Engineering

EE 19 803 (E)—SOLAR PV SYSTEMS

Time : Three Hours Maximum : 100 Marks

Part A

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

I. 1 Explain the principle of photo-voltaic effect with neat sketches.

2 What are the different Solar cell technologies ?

3 Describe effect of cell temperature on cell efficiency.

4 Draw the I-V characteristic of a solar cell and explain.

5 Draw the typical power-voltage characteristics of a solar cell under varying input conditions.

6 How the maximum power is tracked from solar pv systems.

7 Explain the factors that are considered for pv system design.

8 Compare single and multi-crystalline silicon cells.

9 How the cost is estimated in the solar system design ?

10 Calculate the number of 36 V, 10A PV modules required to supplya dc load at 400V and 40A.

11 What is power converter ? Give the classifications of power converter.

12 What is the function of the charge controller ? Write down the features of the charge controller

13 What are the different components of Grid connected PV systems ?

14 Explain balance of system components in the PV system application ?

15 Outline the socio economic merits of photovoltaic systems.

(10 × 5 = 50 marks)

Turn over

Part B

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

II. 1 Explain how solar photovoltaic cell generates electricity in detail.

Or

2 Outline the properties of semiconductors in detail.

3 Explain the necessity of using maximum power point tracking with the help of PV and I-V curves and describe on which factors efficiency of PV cell depends ?

Or

4 Explain the effect of radiation intensity and temperature on short circuit current, open circuit voltage and power generated in PV cell ?

5 What are the different considerations of PV modules to be connected in series an parallel for deciding PV system design ?

Or

6 Draw the schematic diagram of solar lantern system and list out the different components required for the solar lantern design.

7 What are the different types of solar PV systems ? Draw the schematic diagram of each PV systems.

Or

8 Draw the electrical layout of a typical solar PV system, state the functions of essential equipment.

9 Describe the working principle of grid connected SPV system with battery storage.

Or

10 Explain the working of space solar power satellite.

(5 × 10 = 50 marks)

D 123963 Pages: 1 Name:

Reg. No.:

EIGHTH SEMESTER B.TECH (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

619261

ELECTRICAL AND ELECTRONICS ENGINEERING

EE 19 801 - ELECTRICAL SYSTEM DESIGN

Time: Three Hours Maximum: 100 Marks

Part A

Answer any TEN questions

I.
1. Mention the salient features of Indian electricity act?
2. Tell about service connection?
3. Highlight the treatment for electric shock.
4. Explain the protection against short circuit and earth fault.
5. Explain the procedure for pipe earthing
6. Discuss the shielding of electrical systems?
7. Illustrate luminous intensity?
8. State and explain the general rules for interior lighting?
9. Explain about polar curves
10. How the power factor is improved?
11. What is the design factors considered for LT Panels.
12. Illustrate the design concepts of standby generating units
13. State the concept of Earth mat
14. How to measure earth resistance?
15. State the concept of earth mat.

(10 x 5 = 50 Marks)

Part B

Answer any FIVE questions

II.
1. Explain the rules of Indian Electricity and Energy Conservation Act.

OR

2. Describe the classification of supply systems
3. Discuss the methods of internal wiring and explain how to prepare schematic and wiring diagram

OR

4. Explain the selection of switchgear for control and protection against oveload
5. A lamp of 500cp is placed 2 m below a plane mirror which reflects 80% of light falling on it. Determine illumination at a point 5m away from the foot of the lamp which is hung 5m above the ground

OR

6. Write short notes on i) office building lighting ii) Industrial lighting
7. Explain the design of main switch boards and distribution boards considering the electrical services of the building.

OR

8. Discuss the electrical design concept of cinema theatre.
9. Describe how transformers and switchgears were selected for HV systems.

OR

10. Discuss the overall design of earthing systems?

(5 x 10 = 50 Marks)

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D 123965 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Electrical and Electronics Engineering

EE 19 802—SPECIAL ELECTRICAL MACHINES

Time : Three Hours Maximum : 100 Marks

Part A

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

I. 1 List and discuss the applications of Stepper motors.

2 Define pull in torque and pull out torque in stepper motor.

3 Discuss the B-H curves of common permanent magnetic materials.

4 Explain an application of universal motor.

5 Explain the torque slip characteristics of repulsion motor.

6 Outline the torque speed characteristics of hysteresis motor.

7 What are the differences between a Stepper motor and a Servo motor ?

8 What are the various linear synchronous motor topologies ?

9 List different types of Linear motors.

10 What is the need for rotor position sensor in the control of Switched Reluctance Motors ?

11 List the advantages and applications of Switched Reluctance Motors.

12 Discuss the advantages of synchronous reluctance motor.

13 List the main limitations of permanent magnet machines.

14 Compare between BLDC motors and PMSMs.

15 Why the PMBLDC motor is called electronically commutated motor ?

(10 × 5 = 50 marks)

Turn over

Part B

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

II. 1 Explain different configurations for switching the phase windings in stepper motor.

Or

2 Explain torque production in stepper motor. What is the effect of hybrid stepping in the torque production ?

3 Explain the construction and working of AC series motor with neat diagram. Discuss its phasor diagram.

Or

4 Draw the B-H curve of a magnetic material and explain the significance of hysteresis loop.

5 Describe the speed torque characteristics of AC servo motor and derive the transfer function.

Or

6 With a neat diagram, explain the construction of linear synchronous motor. Also list their applications.

7 Explain any *two* power converters for a three-phase, 6/4 Switched Reluctance motor.

Or

8 Draw and describe the phasor diagram of synchronous reluctance motor and derive the torque expression.

9 Construct and explain phasor diagram of PMSM and derive the expression for torque developed.

Or

10 With a neat schematic diagram, explain the sensorless control of a three phase BLDC motor.

(5 × 10 = 50 marks)

D 123967 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Electrical and Electronics Engineering

EE 19 804 (B)—ELECTRICAL ENERGY AUDITING, CONSERVATION AND MANAGEMENT

Time : Three Hours Maximum : 100 Marks

Part A

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

I. 1 Identify the potential of renewable energy in India.

2 State the general principles of energy management.

3 What is meant by optimal load scheduling.

4 Identify the types of boilers.

5 How to assess steam distribution losses.

6 Write in brief about waste heat recovery.

7 Define coefficient of performance.

8 What are the factors that affect the cooling rate in Air conditioning ?

9 State the advantages of waste heat recovery system.

10 Explain the need for energy audit.

11 List the various energy audit instruments.

12 How cogeneration plants are supporting energy conservation ?

13 What is meant by simple payback period ?

14 Explain the terms :

(i) Internal Rate of Return ; and

(ii) Net Present Value.

Turn over

15 How proposals are evaluated ?

(10 × 5 = 50 marks)

Part B

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

II. 1 Discuss the environmental aspects associated with energy utilization.

Or

2 Explain all the possible energy conservation measures possible in lightning system.

3 Discuss in detail the energy conservation opportunities in boilers.

Or

4 Illustrate in detail the fuel economy measures in furnaces.

5 Explain the necessity of insulation in a HVAC system and discuss its advantages.

Or

6 Describe the electrical energy conservation areas in an Air conditioning System.

7 Explain the methodology for detailed Energy Audit Process.

Or

8 Explain the types and schemes of cogeneration.

9 Discuss in detail about the computation of economic aspects by present value Method

Or

10 A company invests Rs. 12 lakhs and completes an energy efficiency project at the beginning of year 1. The firm investing its own money and expects an Internal Rate of Return (IRR) of at least 24 % on constant positive annual net cash flow of Rs. 2.5 lakhs over a period of 5 years starting from year 1 .What is the IRR of this measure ?

(5 × 10 = 50 marks)

D 123970 **(Pages : 3)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Electronics and Communication Engineering

EC 19 804 (D)—CRYPTOGRAPHY AND NETWORK SECURITY

Time : Three Hours Maximum : 100 Marks

Give sketches wherever necessary.

Part A

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

1. With an example, illustrate active security attacks.
2. Enumerate the difference between Substitution and Transposition techniques.
3. List and explain *two* concepts that are useful in evaluating and classifying threats.
4. Draw the block diagram of Block Cipher.
5. Suppose the DES function F mapped every 32-bit input R, regardless of the value of the input K, to (a) 32-bit string of zero (b) R1. Then (a) What function would DES then compute ? (b) What would the decryption look like ?
6. Show that DES decryption is the inverse of DES encryption.
7. Explain public key cryptography.
8. What are the negatives of the following elliptic curve points over Z_7 ?

   $P = (3, 5)$; $Q = (2, 5)$; $R = (5, 0)$.

9. Describe RSA algorithm.
10. What types of attacks are addressed by message authentication ? Explain.
11. What changes in HMAC are required in order to replace one underlying hash function with another ?
12. What are the various threats associated with a direct digital signature scheme ?

Turn over

13. What types of interoperability issues are involved in internet mail architecture and how are they handled ?

14. What is the utility of a detached signature ? Explain.

15. What are the four principal services provided by S/MIME ? Illustrate.

(10 × 5 = 50 marks)

Part B

Answer **all** *questions.*

16. (a) Illustrate the principle of Rotor Machine. (5 marks)

(b) With an example, explain symmetric cipher model. (5 marks)

Or

17. (a) Discuss the various security mechanisms. (5 marks)

(b) Summarize OSI security architecture model with neat diagram. (5 marks)

18. Explain the following modes of operation in block cipher :

(a) Electronic code book and Cipher block chaining. (5 marks)

(b) Cipher feedback mode and output feedback mode. (5 marks)

Or

19. (a) Explain State the five modes of operation of block cipher. (5 marks)

(b) How Meet in the middle attack is performed on double Data encryption Standard ?

(5 marks)

20. Users Alice and Bob use the Diffie-Hellman key exchange technique with a common prime $q = 83$ and a primitive root $\alpha = 5$.

(a) If Alice has a private key $X_A = 6$, what is Alice's public key Y_A ? (5 marks)

(b) If Bob has a private key $X_B = 10$, what is Bob's public key Y_B ? (5 marks)

Or

21. (a) In a public-key system using RSA, you intercept the cipher text C = 10 sent to a user whose public key is $e = 5$, $n = 35$. What is the plaintext M ?

(5 marks)

(b) In an RSA system, the public key of a given user is $e = 31$, $n = 3599$. Determine the private key of this user.

(5 marks)

22. (a) What is Hash function ? Explain different applications of cryptographic hash functions.

(5 marks)

(b) Explain MACs based hash function with its design objectives and structure of the algorithm.

(5 marks)

Or

23. (a) What are the services provided by digital signatures ? Explain if the following are provided

i) Source Authentication ;

ii) Data Integrity ; and

iii) Source Non-Repudiation.

(6 marks)

(b) What is Birthday Attack on Digital Signatures ? Can it be performed by an 'Outsider' ?

(4 marks)

24. (a) Write note on PGP session keys, public/private key rings and passphrase keys.

(5 marks)

(b) What are the similarities and differences between S, MIME and PGP ?

(5 marks)

Or

25. (a) Explain how email messages are protected using S/MIME signing and encryption.

(5 marks)

(b) What is Radix 64 format ? What is its use in PGP ?

(5 marks)

[5 × 10 = 50 marks]

D 123969 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Electronics and Communication Engineering

EC 19 803 (B)—NANO ELECTRONICS

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Explain the quantum dots.
2. Differentiate between quantum wires and dots.
3. List the characteristic lengths in mesoscopic system.
4. Write short notes on Sol-gel process.
5. Explain the features of physical vapour deposition.
6. Explain dry oxidation method.
7. Explain modulation doped quantum wells.
8. Differentiate between multiple quantum wells and super lattice.
9. What is zone folding effect ?
10. Explain the perpendicular transport of charge in nanostructure.
11. Explain the concept of hot electrons.
12. Write a short note on Shubnikove -de Hass effect.
13. Explain the working of quantum dot LED.
14. Explain the principle of carbon nano tube transistors and its three different types.
15. Explain the working of quantum well sub band photo detector.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. Starting from Schrodinger, show that density of states in a 1D semiconductor material is directly proportional to $1/\sqrt{E}$.

Or

17. Explain the features of triangular and parabolic quantum wells.

18. Illustrate the process of molecular beam epitaxy for fabricating nanolayers with neat sketches.

Or

19. Write short notes on :

    i) Carbon nanotubes ; and

    ii) Sol-gel process.

20. Explain the structure and energy band diagram of MOSFET.

Or

21. Explain Kronig-Penney model for superlattice and zone folding.

22. Explain Coulomb blockade in nanostructure.

Or

23. Explain parallel transport in quantum structures and various scattering mechanisms associated with this transport.

24. Explain the working of quantum dot laser and quantum well laser.

Or

25. Explain the structure of Single electron transistor with neat diagrams.

(5 × 10 = 50 marks)

EIGHTH SEMESTER B.TECH(ENGINEERING) DEGREE[2019 SCHEME] 619262

EXAMINATION, APRIL 2025

ELECTRONICS AND COMMUNICATION ENGINEERING

EC 19 801 - IMAGE AND VIDEO PROCESSSING

Time: 3 Hrs Maximum: 100 Marks

PART A

*Answer **any ten** questions*

1. What is unitary transform? List its few properties.
2. Explain DCT transform with an example.
3. How are images sensed and acquired?
4. List few gray-level transform techniques.
5. Differentiate smoothing and sharpening spatial filters.
6. Outline on inverse filtering.
7. Summarize the special features of jpeg standard.
8. What is a colour model? List few of them.
9. How is an image compressed?
10. List few recent developments in image processing.
11. How are boundaries detected in images?
12. What is thresholding? Why is it used?
13. How are video frames classified?
14. List the elements of video encoder and decoder.
15. What are the salient features of H.26 X standard for video coding.

(10 x 5 marks =50 marks)

PART B

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

16. Explain the components of an image processing system with a neat diagram.

Or

17. Explain the following terms in the context of relationship between pixels
(A) neighbourhood (B) adjacency (C) connectivity (D) distance measures.

P.T.O.

18. What is a histogram? How is its processing done? What are its applications.

Or

19. Explain restoration of image in presence of noise.

20. Detail on lossy compression and its types?

Or

21. Explain morphological image processing techniques and algorithm.

22. Give an outline on image fusion and pseudo colouring.

Or

23. Give an account of image segmentation.

24. Explain in detail any two motion estimation techniques in video coding.

Or

25. Explain the video sequence hierarchy.

(5 x 10 marks=50 marks)

D 123968 **(Pages : 2)** **Name.....**

Reg. No.....

EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME] EXAMINATION, APRIL 2025

Electronics and Communication Engineering

EC 19 802—WIRELESS MOBILE COMMUNICATION

Time : Three Hours Maximum : 100 Marks

Part A

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

1. List few salient features of 2G cellular standard.
2. What is meant by diffraction ?
3. Give an account on 3G cellular standard.
4. Explain lognormal shadowing.
5. How does the effect of doppler shift affect in wireless communication ?
6. Write short note on slow and fast fading ?
7. Give an analysis of DSSS systems.
8. Define the terms processing gain and anti-jamming margin.
9. Explain frequency hopped spread spectrum systems.
10. Give an account on MRC receiver.
11. Summarize on CDMA.
12. Give an outline of Altamonte scheme.
13. Explain how space time processing is achieved in MIMO ?
14. Explain about MSK and GMSK.
15. Differentiate between Wi-Fi and Wi-Max.

(10 × 5 = 50 marks)

Turn over

Part B

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

16. In detail, explain concept of hand-off.

Or

17. Explain cell structure and frequency reuse.

18. In detail, explain about narrowband and wideband fading models.

Or

19. Explain about frequency flat and frequency selective fading.

20. Write notes on base station antennas and arrays.

Or

21. Give an outline on monopole antennas and PIFA.

22. Explain in detail about TDMA and FDMA.

Or

23. What is Equalization ? What are its different types ?

24. Explain BPSK and QPSK.

Or

25. Explain the architecture of GSM technology.

(5 × 10 = 50 marks)