

C 24607

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Information Technology

IT 19 606 (E)—MANAGEMENT INFORMATION SYSTEMS

Time : Three Hours

Maximum : 100 Marks

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

1. Describe any two methods of system design.
2. Describe about Open and Closed systems in MIS.
3. Describe in detail about the various functions of Management in MIS.
4. State some of the differences between Database and Traditional files.
5. Explain about the Role of Software in Problem Solving in MIS.
6. Enumerate the application of Bluetooth in Management Information systems.
7. Illustrate the Classification of Decision support system in MIS.
8. Illustrate the need of Information Systems in an Enterprise.
9. State the Characteristics of EIS.
10. Discuss about the Outputs from a Marketing Information systems.
11. Describe any *five* Characteristics of Accounting Information systems.
12. State and Explain about Human resource Information systems.
13. Explain about System Testing and Implementation in MIS.
14. Illustrate the objective of Ends/means analysis.
15. Describe the significance of Information system Organizing in MIS.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer one full section from each question.*

*Each question carries 10 marks.*

16. (a) Describe about the Organization of MIS with a schematic diagram.

*Or*

(b) Describe the Strategic uses of Information Technology in the Emerging Paradigm compared to Old and Intervening Trend of MIS.

17. (a) Explain in detail about Wi-Fi, Wi-Max and Bluetooth and its significance in MIS.

*Or*

(b) Explain about any two Network Topology with suitable diagram.

18. (a) Explain about Office Automation system in detail.

*Or*

(b) Explain about Structured and Unstructured Decision in Decision Support System of MIS.

19. (a) Describe about Sources and Advantages of Production Information systems.

*Or*

(b) Explain with a Case Study about Operational Accounting information systems.

20. (a) Illustrate about System Development Life Cycle in System analysis and design.

*Or*

(b) Illustrate in detail about the Security and ethical issues of Information systems.

(5 × 10 = 50 marks)

C 24590

(Pages : 4)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Electrical and Electronics Engineering  
EE 19 601—POWER SYSTEM ANALYSIS

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

- I. (1) Define bus admittance matrix, bus impedance matrix ?
- (2) Summarize the functions of power system analysis ?
- (3) The per unit impedance of a circuit element is 0.30. If the base kV and base MVA are halved, then the value of per unit impedance of the circuit element will be.
- (4) Summarize the information's that are obtained from a load flow study
- (5) What is the need for slack bus in power flow analysis ?
- (6) Compare GSM and NRM with respect to number of iterations taken for convergence and memory requirement.
- (7) What are the type load frequency control for interconnected power system ?
- (8) What is the necessity to regulate voltage and frequency in the power system ?
- (9) Draw and explain ideal speed droop characteristics of a speed governor.
- (10) Define short circuit capacity of power system.
- (11) Define negative sequence and zero sequence components.
- (12) Why the neutral grounding impedance  $Z_n$  appears as  $3Z_n$  in zero sequence equivalent circuit ?
- (13) Explain steady state stability limit ?
- (14) Write short note on factors influencing transient stability.
- (15) Define swing curve. What is the use of swing curve ?

(10 × 5 = 50 marks)

**Turn over**

## Part B

Answer any **five** questions.

Each question carries 10 marks.

- II. (1) The single line diagram of a simple power system is shown in Fig. The rating of the generators and transformers are given below :

Generator 1 : 25 MVA, 6.6 KV,  $X = 0.2$  p.u

Generator 2 : 5 MVA, 6.6 KV,  $X = 0.15$  p.u

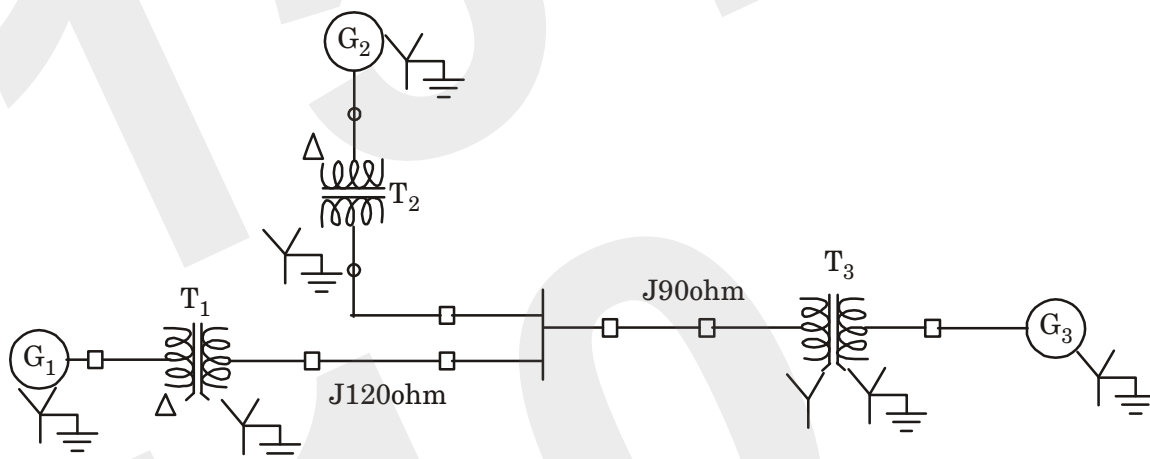
Generator 3 : 30 MVA, 13.2 KV,  $X = 0.15$  p.u

Transformer 1 : 30 MVA, 6.9 $\Delta$ /115Y KV,  $X = 10\%$

Transformer 2 : 15 MVA, 6.9 $\Delta$ /115Y KV,  $X = 10\%$

Transformer 3 : Single phase units each rated 10 MVA, 6.9/69 KV,  $X = 10\%$

Examine the impedance diagram and mark all values in p.u choosing a base of 30 MVA, 6.6 KV in the generator 1 circuit.



Or

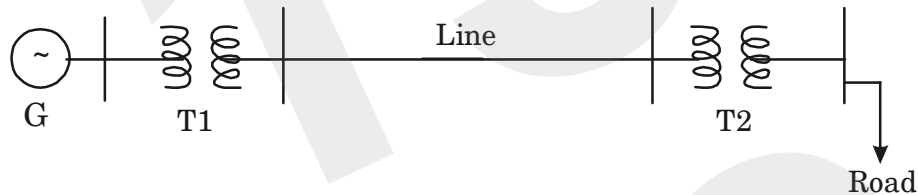
- (2) Give p.u impedance diagram of the power system of figure. Choose base quantities as 15 MVA and 33 KV.

Generator : 30 MVA, 10.5 KV,  $X' = 1.6$  ohms.

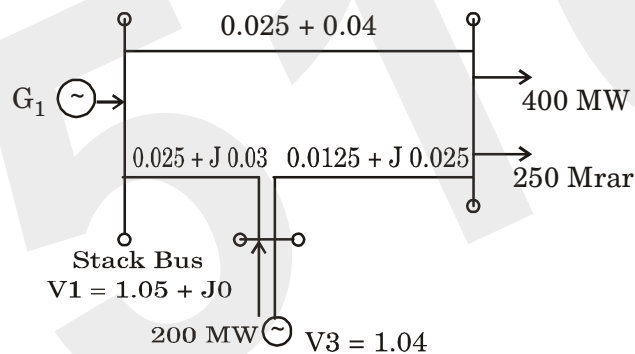
Transformers T1 and T2 : 15 MVA, 33/11 KV,  $X = 15$  ohms referred to HV

Transmission line : 20 ohms / phase.

Load : 40 MW, 6.6 KV, 0.85 lagging p.f.



- (3) The Figure shows the one line diagram of a simple 3 bus system with generation at buses 1 and 3. Line impedance are marked in p.u on a 100 MVA base. Determine the bus voltages at the end of second iteration using Gauss seidal method :



Or

4. Derive N-R method of load flow algorithm and explain the implementation of this algorithm with the flowchart.
5. The fuel inputs per hour of plants 1 and 2 are given as

$$F1 = 0.2P1^2 + 40P1 + 120 \text{ Rs./hr.}$$

$$F2 = 0.25P2^2 + 30P2 + 150 \text{ Rs./hr.}$$

Calculate the economic operating schedule and the corresponding cost of generation. The maximum and minimum loading on each unit are 100 MW and 25 MW. Assume the transmission losses are ignored and the total demand is 180 MW. Also determine the saving obtained if the load is equally shared by both the units.

Or

Turn over

6. What are the components of speed governor system of an alternator? Derive the Mathematical model of speed governor system with aid of block diagram.
7. A 3 phases 5 MVA, 6.6 kV alternator with a reactance of 8 % is connected to a feeder series impedance  $(0.12 + j 0.48)$  ohm/phase/km. through a step up transformer. The transformer rated at 3 MVA, 6.6 kV /33 kV and has reactance of 5 %. Determine the fault current supplied by the generator operating under no load with a voltage of 6.9 kV, when a 3 phases symmetrical fault occurs at a point 15 km. along the feeder.

*Or*

8. Examine the sequence network for a double line to ground (LLG) fault.
9. Describe the equal area criterion for transfer stability analysis of a system.

*Or*

10. A 150 MVA generator-transformer unit having an overall reactance of 0.3 p.u. is delivering 150 MW to finite bus bar over a double circuit 220 KV line having reactance per phase per circuit of 100 ohms. A 3-phase fault occurs midway along one of the transmission line. Give the maximum angle of swing that the generator may achieve before the fault is cleared without loss of stability.

(5 × 10 = 50 marks)

C 24596

(Pages : 3)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Electronics and Communication Engineering

EC 19 601—CONTROL SYSTEM

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer any ten questions.*

*Each question carries 5 marks.*

1. Why is negative feedback preferred in any control systems ?
2. Explain the following terms related to SFG – node, branch, transmittance.
3. How can you move a summing point ahead of a block ?
4. What is meant by generalized error co-efficient ?
5. Determine the damping ratio and frequency of oscillation of a closed loop transfer function of a second order system which is given by  $\frac{20}{s^2 + 10s + 20}$ .
6. List the various time domain specifications of a control system.
7. What is a Nichol's chart ? List any *three* advantages.
8. List few advantages of frequency domain analysis.
9. Explain the terms gain margin and phase margin.
10. Draw the block diagram of a sampled data control system and explain about it.
11. Explain about stability analysis using bilinear transformation.
12. Give an account on the relation between  $s$  and  $z$  domain.
13. What are phase variables ? What are its advantages ?
14. Explain how  $e^{At}$  can be calculated using laplace transform.
15. What are the three basic components used to construct state model ?

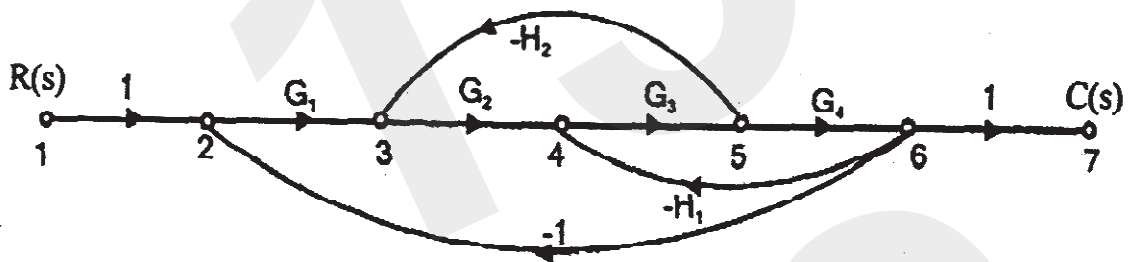
(10 × 5 = 50 marks)

**Turn over**

## Part B

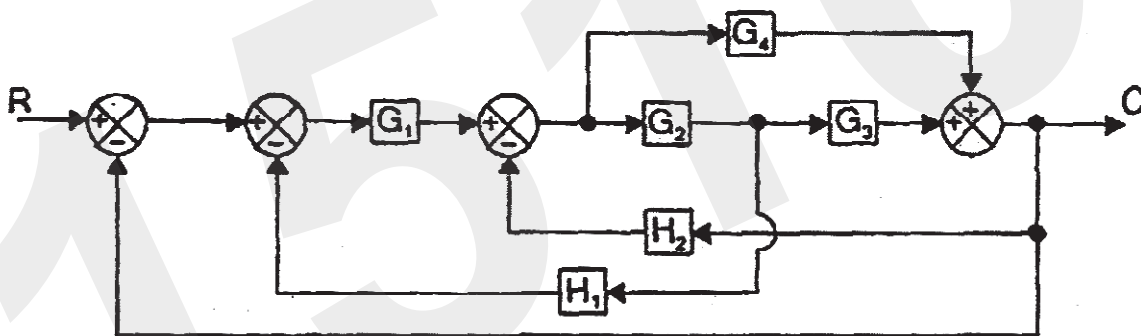
Answer any **one** question from each module.

16. Calculate the overall gain  $C(s)/R(s)$  for the SFG given below.



Or

17. Using block diagram reduction technique, determine the transfer function of the block diagram given below.



18. Determine the steady state error when the input is unit ramp signal for a type 0, type 1 and type 2 systems.

Or

19. A unity feedback system is characterized by the open loop transfer function  $G(s) = K/s(s + 10)$ . Determine  $K$  for a damping ratio of 0.5. Also determine peak over shoot and time for peak over shoot for a unit step input.
20. Explain what is meant by  $M$  and  $N$  circles? Also how is gain adjustment done in Nichol's chart.

Or



21. Plot the bode diagram for the following transfer function :

$$G(s) = \frac{10}{s(1 + 0.4s)(1 + 0.1s)}$$

22. Check for stability of the sampled data-controlled system given whose characteristic equation is given by  $z^4 - 1.7z^3 + 1.04z^2 - 0.268z + 0.024 = 0$ .

*Or*

23. Find the one-sided  $z$ -transforms of the discrete sequences generated by mathematically Sampling the following continuous time functions.

(i)  $\cos \omega t$  ; and

(ii)  $\sin \omega t$ .

24. Construct a state model for a system characterized by differential equation :

$$\frac{d^3 y}{dt^3} + 6 \frac{d^2 y}{dt^2} + 11 \frac{dy}{dt} + 6y + u = 0.$$

Also give the block diagram representation of the state model.

*Or*

25. Consider the matrix A given below and compute  $e^{At}$  by any method :

$$A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}.$$

(5 × 10 = 50 marks)

C 24602

(Pages : 3)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Information Technology

IT 19 601—COMPILER DESIGN

Time : Three Hours

Maximum : 100 Marks

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

1. Explain the concept of bootstrapping in compiler design.
2. Enumerate the differences between compilers and interpreters.
3. Depict the phases of a compiler with diagram.
4. How will you define a context free grammar ?
5. Draw syntax tree for the expression  $a = b * - c + b * - c$ .
6. Give the transition diagrams for the given grammar :

 $E \rightarrow TE'$  $E' \rightarrow + TE' \mid \epsilon$  $T \rightarrow FT'$ 

7. Summarize the merits and demerits of LALR parsers.
8. Show that the given grammar is ambiguous :  $S \rightarrow aSbS \mid bSaS \mid \epsilon$ .
9. State the rules for defining precedence relations.
10. Consider the following expression and construct a DAG for it :  $(a + b) \times (a + b + c)$ .
11. Specify the kinds of programming errors detected by a compiler on static checking.
12. Explain the organization of run time storage for the compiled program.
13. Generalize the importance of code optimization in compiler design.

**Turn over**

14. What is loop optimization ? Mention the important techniques of loop optimization.
15. Point out the usage of registers in making faster computations.

(10 × 5 = 50 marks)

### Part B

Answer **one** full section from each question.

Each question carries 10 marks.

16. a) Explain the output of the expression  $a := b + c * 20$  in each phase of a compiler in detail.

Or

- b) List the operations on languages and discuss the algebraic properties of regular expressions. Also give the regular expression to describe a language consist of strings made of even numbers of  $a$  and  $b$ .

17. a) Explain the various strategies of a parser to recover from a syntactic error.

Or

- b) Explain the method of construction of a predictive parsing table and give the differences between recursive descent predictive parsers and non-recursive predictive parsers.

18. a) Consider the following grammar :

$E \rightarrow E - E$

$E \rightarrow E \times E$

$E \rightarrow \text{id.}$

Parse the input string  $\text{id} - \text{id} \times \text{id}$  using a shift-reduce parser.

Or

- b) Explain canonical LR parser and construct a canonical LR parsing table for the given context free grammar :

$S \rightarrow AA \quad A \rightarrow aA \mid b$

19. a) What is a three address code ? List the types of common three address code statements.

Or

- b) Compare and contrast dynamic storage allocation strategies in detail.

20. a) How do you calculate the cost of an instruction? Prepare the total cost of the following target code and explain the effect of minimizing instruction cost in execution.

MOV a, R0

ADD b, R0

MOV C, R0

ADD R0, R1

MOV R1, X

*Or*

- b) Explain simple code generation algorithm and write the code sequence for  $d := (a - b) + (a - c) + (a - c)$ .

(5 × 10 = 50 marks)

C 24608

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Mechanical Engineering

ME 19 601—THERMAL ENGINEERING

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. State zeroth law and first law of thermodynamics.
2. Brief on Internal Combustion engines.
3. A system consisting of some fluid is stirred in a tank. The rate of work done on the system by stirrer is 2.25hp. The heat generated during stirring is dissipated to the surrounding. If the heat transferred to the surrounding is 3400 kJ/hr, determine the change in internal energy.
4. A heat engine operates between a heat source at 700 K and a heat sink at 300 K. What is the maximum efficiency of the engine ?
5. Define Volumetric Efficiency and Thermal Efficiency
6. With a neat sketch brief on the concept of T-S diagram on Carnot cycle.
7. List some remedies for the air pollution from I.C Engines.
8. A gas turbine plant operates on the Brayton cycle between  $T_{\min} = 300$  K and  $T_{\max} = 1073$  K. Find the maximum work done per kg of air, and the corresponding cycle efficiency. How does this efficiency compare with the Carnot cycle efficiency operating between the same two temperatures ?
9. With a neat sketch brief on pressure-volume diagram on Brayton cycle.
10. Derive the expression for shaft work required in iso-thermic compression of ideal gases.
11. Brief on refrigeration.
12. What is termed as Relative efficiency, regeneration and reheating ?
13. Outline the types of boilers.

**Turn over**

14. Define the following terms - (i) Heat ; (ii) Heat transfer ; and (iii) Thermodynamics.
15. Brief on the effect of thermal conductivity with temperature.

(10 × 5 = 50 marks)

### Part B

*Each question carries 10 marks.*

16. Explain in detail about four stroke IC Engine with a neat sketch.

*Or*

17. A cylinder fitted in the piston has a volume of  $0.1 \text{ m}^3$  and contains  $0.5 \text{ kg}$  of steam at  $500 \text{ kPa}$ , How much heat is to be supplied to bring the temperature of the steam to  $823 \text{ K}$  keeping the pressure constant. What is the work done in the process ?
18. A diesel engine operates with a compression ratio of 15. The pressure and temperature at the beginning of compression stroke are  $100 \text{ kPa}$  and  $300 \text{ K}$ . Heat is transferred at a rate of  $500 \text{ kJ/kg}$  of the working fluid per cycle. Determine i) the pressure and temperature at each stage of the cycle ; ii) The work done per kg of air ; and iii) Thermal efficiency.

*Or*

19. Explain in detail with neat sketch the mechanism of Diesel cycle and derive for its thermal efficiency.
20. A vapour compression cycle using ammonia as a refrigerant is employed in an ice manufacturing plant. Cooling water at  $288 \text{ K}$  enters the condenser at a rate of  $0.25 \text{ kg/s}$  and leaves at  $300 \text{ K}$ . Ammonia at  $294 \text{ K}$  condenses at a rate of  $0.5 \text{ kg/min}$ . Enthalpy of liquid ammonia at  $294 \text{ K}$  is  $281.5 \text{ kJ/kg}$  compressor efficiency is  $90 \%$ . The saturated ammonia vapour at  $258 \text{ K}$  and enthalpy of  $1426 \text{ kJ/kg}$  enters the compressor. What is the power requirement of the compressor and the refrigeration capacity in tons ?

*Or*

21. Elaborate in detail the stages of combustion in C.I Engines.
22. Explain in detail the different factors for the analysis of gas turbines cycles.

*Or*

23. With a neat sketch, explain in detail the Rankine cycle and modified Rankine cycle.
24. Describe with a neat sketch the working principle of Cochran boiler and list its applications

*Or*

25. Write short notes on steam nozzles and steam turbines.

(5 × 10 = 50 marks)

C 24614

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Printing Technology

PT 19 601—SCREEN PRINTING AND GRAVURE

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. What are the four types of photographic stencils ? Brief.
2. What are monofilament and multifilament meshes ? Explain.
3. List four functions of squeegee.
4. How do you carry out registration of 2 color job on flat bed screen printing machines? Explain.
5. Draw a flat bed press and label all the parts and explain.
6. Explain oxidation polymerization and penetration methods of ink drying.
7. Write a short note on publication gravure and the applications.
8. Explain the process of intaglio plate printing. How is it different from gravure ?
9. Discuss the gravure cylinder designs and cylinder construction.
10. Describe positive angle and reverse angle doctor blade systems.
11. Describe the gravure impression drum used in CIC presses.
12. What are the roller coverings used on gravure impression roller ? Explain.
13. Explain the need for ink drying in multicolor gravure process.
14. What are the limitations of gravure dryers and why ? Describe.
15. Describe briefly on gravure paper substrates.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer one full question from each section.*

*Each question carries 10 marks.*

16. a) Explain the step by step procedure of making direct stencils with simple diagrams for each stage.

*Or*

- b) Describe the five parameters of squeegee that has influence on ink deposit in screen printing.

17. a) Explain with neat diagram, the working principle of fully automatic flatbed screen printing machine.

*Or*

- b) Discuss different areas of applications of screen printing with type of ink used for each application.

18. a) With neat diagram, explain the stages involved in making gravure cylinder using electromechanical process.

*Or*

- b) What are the different methods of reusing the gravure cylinders? Discuss.

19. a) Describe doctor blade parameters: blade angle, blade pressure, blade edge, back-up blade, Blade distance from nip.

*Or*

- b) Discuss any five gravure doctor blade issues that affect print quality. Mention their causes and solutions

20. a) With neat diagram, explain the vertical stack press configuration of gravure presses. List advantages and disadvantages.

*Or*

- b) With neat diagram, explain the working of solvent recovery plant used in gravure presses.

(5 × 10 = 50 marks)



C 24591

(Pages : 3)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Electrical and Electronics Engineering  
EE 19 602—MODERN CONTROL THEORY

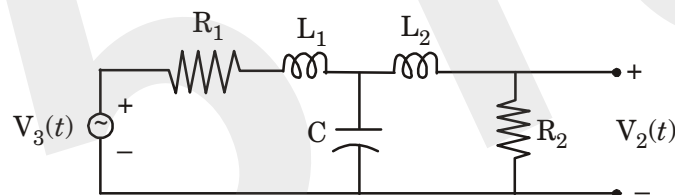
Time : Three Hours

Maximum : 100 Marks

**Part A**

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

- List out least one advantage and one disadvantages of selecting :
  - Physical variable.
  - Phase variable.
  - Canonical variables for state - space formulation of control systems.
- Obtain the state model in physical variable form for the circuit shown in Figure below :



- Construct a state model for a system characterized by a differential equation :

$$\ddot{y} + 6\dot{y} + 11y = \ddot{u} + 8\dot{u} + 17u + 8u$$

- What is a Non-linear system? What are the different types of Non-linearity's ? Explain each of them in detail.
- Derive the describing function of Dead-zone and saturation Non-linearity.
- Briefly explain the concept of equilibrium points and the stability definitions.
- State and prove the Liapunov's stability theorem for linear time invariant systems.
- Summarize the negative definiteness of scalar functions. Give an example ?
- Mention the advantages of Lyapunov's stability criteria.
- What is the state observer ? Draw the diagram for State Observer and point out main features.

Turn over

11. Illustrate the block diagram of a system with state feedback concept for controller.
12. Explain the method of control system design by pole placement.
13. Write the steps involved for solving the problem using optimal control.
14. Formulate Performance Index for Time-Optimal Control System.
15. Write short notes on Performance Index for Minimum-Energy Control System

(10 × 5 = 50 marks)

**Part B**

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

1. Represent the following system in state space :

Jordan canonical form :  $G(s) = \frac{(s+2)}{(s+5)^2 + (s+7)^2}$  and obtain their state diagram.

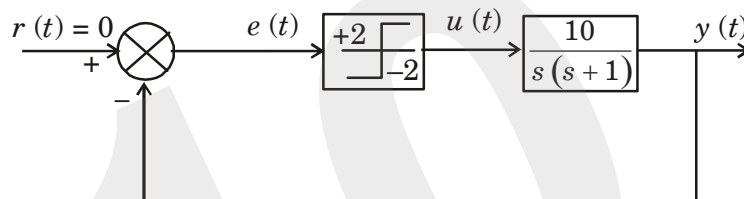
Or

2. A system is described by the following differential equation. Represent the system in state space

$$\frac{d^3x}{dt^3} + 3\frac{d^2x}{dt^2} + 4\frac{dx}{dt} + 4x = u_1(t) + 3u_2(t) + 4u_3(t) \quad \text{the outputs are :}$$

$$y_1 = 4\frac{dx}{dt} + 3u_1 ; y_2 = \frac{d^2x}{dt^2} + 4u_2 + u_3$$

3. Construct the phase trajectory of the following system by using the method of isoclines shown in figure.



Or

4. What is a singular point ? Draw the phase trajectory of the following singular points :  
(i) Stable node ; (ii) Unstable node ; (iii) Saddle point ; and (iv) Vortex point.

5. A single input system is given by the following state equation :

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} -1 & 0 & 0 \\ 1 & -2 & 0 \\ 2 & 1 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 10 \\ 1 \\ 0 \end{bmatrix} u.$$

Design a state feedback controller which will give closed-loop poles at  $-1 \pm j2, -6$ . Determine the state feedback gain matrix by anyone method.

*Or*

6. Explain the controllable canonical form for an example.
7. Estimate the direct method of Lyapunov's function how it can be applicable for non-linear continuous time system

*Or*

8. Summarize Krasovskii method and how it can be applicable for stability analysis explain with an example for it.
9. Explain classical and modern control with single input and single output with block diagram.

*Or*

10. Derive equation for Quadratic Performance Index with Linear Constraint.

(5 × 10 = 50 marks)

C 24597

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Electronics and Communication Engineering

EC 19 602—VLSI DESIGN

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. What is channel length modulation ?
2. Explain the pseudo NMOS logic.
3. Give the principle of constant field scaling and its effect on device characteristics.
4. Discuss the operation of differential sense amplifier.
5. Explain the working of carry select adder.
6. Explain the architecture of ROM.
7. Explain Oxidation.
8. What is optical lithography ?
9. Differentiate dry and wet etching.
10. What is SWAMI process ?
11. Write short notes on multi-level metallization.
12. Explain alloyed contacts.
13. Differentiate p-well and n-well processes.
14. Define the lambda layout rules.
15. Draw the circuit schematic and stick diagram of CMOS 2 input NAND gate.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

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

16. Explain the operation of CMOS inverter and derive an expression for its propagation delay.

*Or*

17. Explain the following :

i) Drain induced barrier lowering.

ii) Subthreshold conduction.

18. Design a pass transistor based 4x1 multiplexer.

*Or*

19. Explain the working of 1-transistor DRAM cell. Give the differences between SRAM and DRAM.

20. Explain in detail the Deal - Givé model of oxidation process.

*Or*

21. Define Etching. Explain the different types of etching.

22. Explain in detail device isolation.

*Or*

23. Explain the LOCOS and SILO process.

24. Explain the steps involved in twin tub process of CMOS fabrication.

*Or*

25. Explain the layout of MOSFET.

(5 × 10 = 50 marks)

C 24603

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Information Technology

IT 19 602—COMPUTER NETWORKS

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Differentiate broadcast and point-to-point networks.
2. Explain X.25 and frame relay in the area of computer networking.
3. List and explain the five distribution services provided by Wireless LANs.
4. Compare datagram and virtual circuit subnets.
5. Mention the advantages and limitations of flooding in computer networks.
6. Elaborate the registration procedure of newly arrived mobile host.
7. Write any five principal ICMP message types.
8. Explain how the limitation of RARP is handled by BOOTP ?
9. Enumerate the major goals of IPV6.
10. Specify the primitives for a simple transport service.
11. Highlight the three methods that support packet lifetime restriction.
12. Tabulate the differences between TCP and LDP.
13. State the basic functions supported by e-mail systems.
14. Enumerate the key features of static and dynamic web pages.
15. Compare and contrast H.323 and SIP.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

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

16. a) With a neat sketch, explain the layers of OS1 reference model.

*Or*

b) Discuss the architecture of Bluetooth and Bluetooth protocol stack with diagram.

17. a) Briefly explain the design issues of network layer.

*Or*

b) Illustrate the concept of Dijkstra's shortest path routing with an example.

18. a) Describe the working of interior gateway routing protocol with diagram.

*Or*

b) Explain in detail about Internet Multicasting.

19. a) Illustrate the relationship between TSAP, NSAP and transport connection with diagram.

*Or*

b) With diagrammatic representation, outline the layout of TCP segment and explain each field in the header.

20. a) What is the role of resolver in DNS ? Explain the working of a resolver for a domain in eight steps.

*Or*

b) Summarize the working of POP3 and IMAP on e-mail systems.

(5 × 10 = 50 marks)

C 24609

(Pages : 3)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Mechanical Engineering  
ME 19 602—MACHINE DESIGNS

Time : Three Hours

Maximum : 100 Marks

*Each question carries 20 marks.*

1. (a) (i) Discuss the various steps in design process. (10 marks)  
(ii) Explain the methods to reduce stress concentration. (10 marks)

*Or*

- (b) A bolt is subjected to an axial pull of 8 kN and a transverse shear force of 3 kN. Determine the diameter of the bolt required based on :  
(i) Maximum principal stress theory.  
(ii) Maximum shear stress theory.

Take elastic limit in simple tension is equal to 270 MPa and Poisson's ratio = 0.3. Assume factor of safety as 3.

2. (a) A double riveted double cover butt joint in plates 20 mm. thick is made with 25 mm. diameter. Rivets at 100 mm. pitch. The permissible stresses are  
 $\sigma_t = 120 \text{ N/mm}^2$ ,  $\sigma_c = 150 \text{ N/mm}^2$ ,  $\zeta = 100 \text{ N/mm}^2$ .

Find the efficiency of the joint, taking the strength of the rivets in double shear as twice than that of single shear.

*Or*

- (b) A cylindrical pressure vessel with 1 m. inner diameter is subjected to internal steam pressure of 1.5 MPa. The permissible stresses for the cylinder plate and the rivets in tension, shear and compression are 80, 60 and 120 N/mm<sup>2</sup> respectively. The efficiency of longitudinal joint can be taken as 80 % for the purpose of calculating the plate thickness. The efficiency of circumferential lap joint should be at least 62 %. Design the circumferential lap joint and calculate :

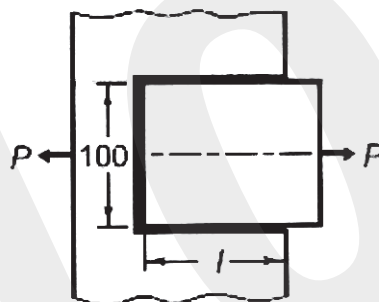
**Turn over**



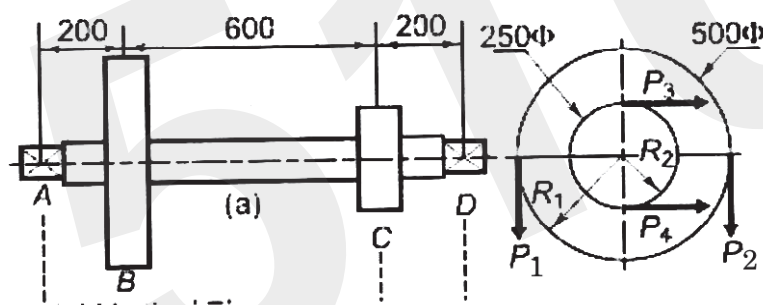
- (i) Thickness of the plate ;
  - (ii) Diameter of the rivets ;
  - (iii) Number of rivets ;
  - (iv) Pitch of rivets ;
  - (v) Number of rows of rivets ; and
  - (vi) Overlap of the plates.
3. (a) A cylinder head is connected to the cylinder flange by 12 bolts. The inside diameter of the cylinder is 480 mm. and the maximum pressure inside it is restricted to 1.5 MPa. If the bolts have a permissible tensile strength of 80 MPa. Determine the size of bolts neglecting initial tightening.

Or

- (b) A cast iron cylinder head is fastened to a cylinder of 500 mm. bore with 8 stud bolts. The maximum pressure inside the cylinder is 2 MPa. The stiffness of part is thrice the stiffness of the bolt. What should be the initial tightening load so that the point is leak proof at maximum pressure ? Also choose a suitable bolt for the above application.
4. (a) A steel plate, 100 mm. wide and 10 mm. thick, is joined with another steel plate by means of single transverse and double parallel fillet welds, as shown in Fig. The strength of the welded joint should be equal to the strength of the plates to be joined. The permissible tensile and shear stresses for the weld material and the plates are 70 and 50 N/mm<sup>2</sup> respectively. Find the length of each parallel fillet weld. Assume the tensile force acting on the plates as static.



- (b) A safety valve 40 mm in diameter is to blow-off at a pressure of 1.2 MPa. It is held on its seat by means of a helical compression spring, with initial compression of 20 mm. The maximum lift of the valve is 12 mm. The spring index is 6. The spring is made of cold-drawn steel wire with ultimate tensile strength of  $1400 \text{ N/mm}^2$ . The permissible shear stress can be taken as 50 % of this strength. Design the spring. Take modulus of rigidity,  $G = 81370 \text{ N/mm}^2$ .
5. (a) The layout of a transmission shaft carrying two pulleys B and C and supported on bearings A and D is shown in Fig. Power is supplied to the shaft by means of a vertical belt on the pulley B, which is then transmitted to the pulley C carrying a horizontal belt. The maximum tension in the belt on the pulley B is 2.5 kN. The angle of wrap for both the pulleys is  $180^\circ$  and the coefficient of friction is 0.24. The shaft is made of plain carbon steel 30C8 ( $S_{yt} = 400 \text{ N/mm}^2$ ) and the factor of safety is 3. Determine the shaft diameter on strength basis.



All dimensions are in mm.

Or

- (b) A rigid type of coupling is used to connect two shafts transmitting 15 kW at 200 r.p.m. The shaft, keys and bolts are made of C 45 steel and the coupling is of cast iron. Design the coupling.

Note : The following data books are permitted for reference :

- (1) PSG Design Data, DPV printers, Coimbatore.
- (2) Prof. Narayana Iyengar B. R, Machine Design Data Handbook.
- (3) K. Mahadevan, Design Data Handbook, CBS publishers.

(5 × 20 = 100 marks)

C 24615

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Printing Technology

PT 19 602—POST PRODUCTION TECHNOLOGY

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Write a notes on use and care of materials used in binding department.
2. Discuss the reinforcing materials used for book binding.
3. What are the factors to be considered for selection of different materials used in binding ?
4. What are the operating parameters for adhesives ? Discuss.
5. Describe the selection of adhesives based on contact angle and wettability.
6. With an example explain the adhesives that cure by mixing two or more components.
7. Explain the principle of five-knife pile trimmers.
8. What is automatic programming system on guillotine cutters ? Explain.
9. Explain the principles of cutting.
10. Explain the use of predators, creasers and slitters.
11. Describe accordion and double parallel folds.
12. Describe combination folding machine.
13. Differentiate between tape and cord sewing.
14. What is Varnishing ? Discuss overall varnishing and spot varnishing.
15. Describe the method of adhesive binding.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer one full question from each section.*

*Each question carries 10 marks.*

16. a) Describe the procedure for paper and board buying and explain how does the value of paper gets an appreciation over a period of time.

*Or*

- b) Discuss the care and handling of paper and issues of fungi and pests in bindery.

17. a) Explain each with their applications the different classifications of adhesives used in binding ?

*Or*

- b) Explain the absorption and electrostatic theory of adhesion with examples.

18. a) Describe the principle of a three knife trimmer with its features and operations.

*Or*

- b) What are the issues that you face on trimming machines ? What are their causes and remedies ? Discuss.

19. a) Explain the principle of rotary pile feeders used on folding machines with neat diagram and applications.

*Or*

- b) Explain the principle of upright delivery unit used on folding machines with neat diagram and applications.

20. a) With a neat diagram explain the components and working of a side sewing machine.

*Or*

- b) What are the stages of an adhesive binding ? Explain each stage in details.

(5 × 10 = 50 marks)

C 24592

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Electrical and Electronics Engineering  
EE 19 603—POWER ELECTRONICS

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer any ten questions.*

*Each question carries 5 marks.*

- I. 1 Summarize the conditions under which a transistor operates as a switch.
- 2 Examine how is  $di/dt$  and  $dv/dt$  protection provided in SCR ?
- 3 Tabulate the various forced commutation techniques used to turn off SCR.
- 4 Examine the effect of source impedance on the performance of converter.
- 5 Justify the power factor of semi converter is better than full converter.
- 6 What is meant by phase control ?
- 7 Outline a method of voltage control used in an inverter.
- 8 Explain the function of feedback diodes in bridge inverter.
- 9 List the various advantages of using PWM control of inverters.
- 10 What is the principle of ON-OFF control of AC controller.
- 11 Write the principle of operation of cycloconverter.
- 12 Explain the input power factor with R load in AC Voltage controller.
- 13 A step up chopper is operated with a duty ratio of 0.6 for a dc input of 100 V. Determine the output voltage for a load resistance 5 ohm.
- 14 Why forced commutation is used in DC chopper ?
- 15 Explain with neat block diagram the working of SMPS ?

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer any five questions.*

*Each question carries 10 marks.*

- II. 1 Examine the structure and different modes of operation with the characteristics of TRIAC.
- Or*
- 2 Examine the basic structure of IGBT and Explain its working. Give its equivalent circuit and explain the turn ON and turn OFF processes
- 3 Describe the operation of three phase semi converter with R load and also draw the output voltage waveforms.
- Or*
- 4 Explain the operation of a single phase full converter with RLE load using relevant waveforms, obtain the expressions for its average output voltage and RMS value of output voltage.
- 5 Describe the operation of 3 phase bridge inverter for 120 degree mode of operation with aid of relevant phase and line voltage waveforms.
- Or*
- 6 Describe in detail, the various types of PWM methods available for voltage control employed in an inverter.
- 7 Draw and Describe the circuit diagram of single phase AC voltage controller with RL load. Explain the circuit operation with necessary waveforms.
- Or*
- 8 Describe the operating principle of single phase to single phase cycloconverter with continuous and discontinuous load current with circuit and waveform.
9. (a) A step down DC Chopper has input voltage of a 230 V with 10 Ohms load resistor connected, voltage drop across chopper is 2 V when it is ON. For duty cycle of 0.5. Calculate :
- (i) Average and RMS value of output voltage. (5 marks)
- (ii) Power delivered to load. (5 marks)
- (b) What is constant frequency control of chopper ? (5 marks)
- Or*
10. Draw the circuit diagram of a buck converter and explain its operation with equivalent circuit for different modes and waveforms.

(5 × 10 = 50 marks)

C 24598

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Electronics and Communication Engineering

EC 19 603—DATA COMMUNICATION AND NETWORKING

Time : Three Hours

Maximum : 100 Marks

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

1. With a conceptual diagram, explain serial communication.
2. Explain the TCP/IP protocol.
3. What is meant by simplex communication ?
4. Explain any one asynchronous communication protocol.
5. Describe coaxial cable with necessary diagram.
6. Write short note on Ethernet (802.3).
7. Explain the term Telnet.
8. Summarize on IPv6 protocol.
9. What do you understand by the term www ?
10. State the Erlang formula.
11. Define GoS. How do you calculate it ?
12. How is incoming traffic and service time characterized ?
13. Write short note on network- based IDS.
14. Describe what is meant by SSL.
15. How is security ensured at application layer ?

(10 × 5 = 50 marks)

**Turn over**

**Part B**

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

Each question carries 10 marks.

16. Explain the different layers of OSI model.

Or

17. Differentiate between synchronous and asynchronous communication.

18. Illustrate with an example how error detection is possible in data communication.

Or

19. What are the features and applications of CSMA/CD.

20. Explain any *one* scheme used for congestion control.

Or

21. Write short notes on ARP and RARP.

22. Explain in detail about Continuous time and discrete time Markov chains.

Or

23. With a neat diagram, explain about infinite server-case State dependent Queues death.

24. Describe in detail on IPSec.

Or

25. What is a firewall ? What are its types ? List few limitations of firewall.

(5 × 10 = 50 marks)



C 24604

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Information Technology

IT 19 603—MICRO PROCESSORS

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Give the significance of memory in a microprocessor.
2. Write a 8086 assembly language program to display the given string using library functions.
3. Explain briefly about the usage of stacks in 8086 microprocessor.
4. What is the function of queue status ? Tabulate the encoding of queue status indication.
5. Explain the general bus operation of 8086 microprocessor.
6. Elaborate the signals for minimum mode operation of 8086.
7. Draw the schematic diagram of memory interfacing with microprocessor.
8. Differentiate memory mapping and I/O mapping.
9. Explain the types of address decoding techniques.
10. What are the modes of operation supported by 8255 ?
11. List the functions performed by 8279 programmable keyboard.
12. Highlight the features of 8259 programmable interrupt controller.
13. How the registers are organised in an ARM Processor ?
14. Explain the instruction pipeline used in ARM7TDMI Processor.
15. Summarize the tradeoffs between RISC and CISC machines.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer **one** full section from each question.*

*Each question carries 10 marks*

16. (a) List and explain the assembler directives of 8086 microprocessor.

*Or*

(b) Develop an assembly language program to copy the string of successive memory locations from one memory to other using string instructions and without using string instructions.

17. (a) What are interrupts? Discuss the classification of interrupts in 8086 microprocessor.

*Or*

(b) Explain briefly the components of bus interface unit of 8086 microprocessor.

18. (a) Elaborate the methods of interfacing static RAM and Dynamic RAM.

*Or*

(b) Design an interface between 8086 CPU and two chips of 16Kx8 EPROM and 32Kx8 RAM. The RAM address must start at 00000 H.

19. (a) Discuss the features of programmable timer and explain its different modes of operation.

*Or*

(b) Draw the block diagram of 8279 and explain the functions of each block.

20. (a) Summarize the characteristic features of RISC architecture.

*Or*

(b) Discuss different types of addressing modes in ARM processor.

(5 × 10 = 50 marks)

C 24610

(Pages : 4)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Mechanical Engineering

ME 19 603—DYNAMICS OF MACHINERY

Time : Three Hours

Maximum : 100 Marks

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

1. State the conditions for static equilibrium of planar member acted upon by three forces.
2. Draw the free body diagram of pair of spur gears are in mesh and specify the reaction forces.
3. State any *two* merits, demerits and applications of worm and worm wheel drives.
4. List the steps in dynamic force analysis of a planar four bar linkage.
5. Specify the effect of crank angle on inertia force of slider and the turning moment in crank of a slider crank mechanism. Also, state the conditions for maximum of aforementioned forces and moments.
6. Specify any *four* methods that can be employed for the dynamic force analysis of planar linkage.
7. 'Unbalance forces in reciprocating parts are generally balanced'-Justify.
8. Define the term angle of heel' and illustrate with simple sketch.
9. State the effect of radius of gyration of flywheel rim on the energy storing capability.
10. Define the following terms : (i) Time period ; and (ii) Critical damping co-efficient.
11. State the effect of damping factor and the frequency ratio on the force transmissibility of free longitudinal vibrating system.
12. Brief about the support motion in longitudinal vibrating system.
13. Write the equation of motion of a single degree of freedom forced vibrating system and brief about each terms in it.
14. What is torsionally equivalent shaft ? Specify the conditions.
15. Draw the approximate mode shape of two rotors torsional vibrating system and specify the node.

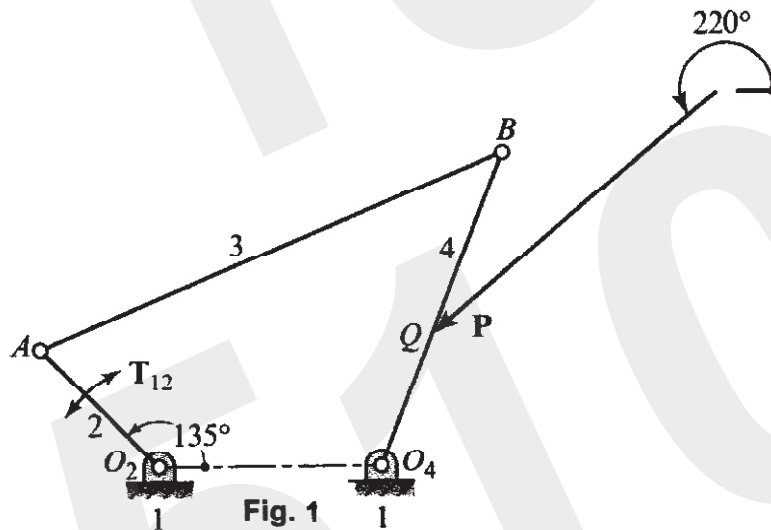
(10 × 5 = 50 marks)

**Turn over**

## Part B

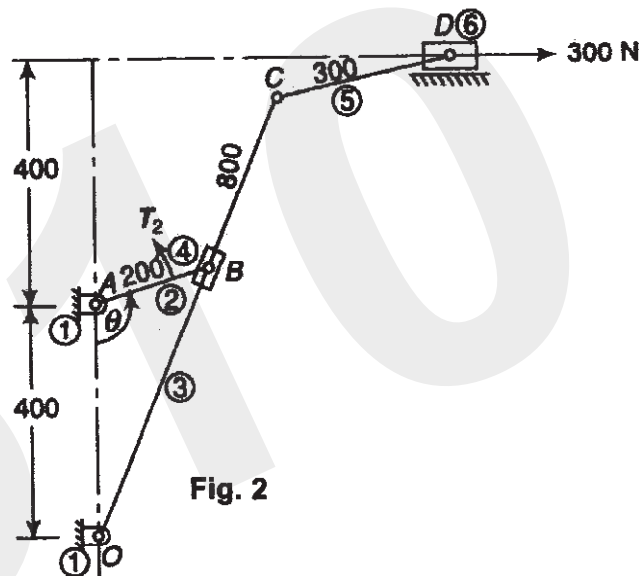
Answer **all** questions. Each question carries 10 marks.

16. The four-bar linkage shown in Fig. 1 has an external load  $P = 534 \text{ N}$  at  $220^\circ$  acting on link 4 at point  $Q$ . For the posture shown, find the constraint forces and the crank torque  $T_{12}$  to hold the linkage in static equilibrium. The dimensions are as follows:  $AO_2 = 152 \text{ mm}$ ,  $BA = 457 \text{ mm}$ ,  $O_4O_2 = 203 \text{ mm}$ ,  $BO_4 = 305 \text{ mm}$ , and  $QO_4 = 127 \text{ mm}$ .



Or

17. For the static equilibrium of the quick return mechanism shown in Fig. 2, find the maximum input torque,  $T_2$  required for a force of  $300 \text{ N}$  on the slider  $D$ . The co-efficient of friction between the sliding pair may be taken as  $0.15$ . Given that,  $\theta = 105^\circ$ . All dimensions shown in Fig. 2 are in  $\text{mm}$ .



18. In slider crank mechanism, the crank is 300 mm long and connecting rod 850 mm long. The piston is of 90 mm in diameter and gas pressure acting on the piston is 5 MPa. When the crank is at  $45^\circ$  from inner dead center find, the thrust on the connecting rod and the torque acting on the crank shaft. Use analytical approach.

Or

19. The piston diameter of an internal combustion engine mechanism shown in Fig. 3, is 125 mm and the stroke is 220 mm. The connecting rod is 4.5 times the crank length and has a mass of 50 kg. The mass of reciprocating parts is 30 kg. The center of mass of connecting rod from the crank pin center is at 170 mm and its radius of gyration is 148 mm. The engine runs at 320 r.p.m. Find the magnitude and the direction of driving torque required for dynamic equilibrium. Given that,  $A_B = 90 \text{ m/s}^2$  at  $180^\circ$  CCW from first quadrant,  $\alpha_3 = 157 \text{ rad/s}^2$  CW,  $A_G = 107 \text{ m/s}^2$   $160^\circ$  CCW from first quadrant. Use graphical approach.



20. A rotating shaft carries three unbalanced masses of 4 kg, 3 kg and 2.5 kg at radial distances of 75 mm, 85 mm and 50 mm at an angular position of  $45^\circ$ ,  $135^\circ$  and  $240^\circ$  respectively. The 2<sup>nd</sup> and the 3<sup>rd</sup> masses are in the planes at 200 mm and 375 mm from the plane of 1<sup>st</sup> mass. The angular positions are measured in counter clockwise direction from first quadrant and viewing the shaft from the 1<sup>st</sup> mass end. The shaft length is 0.8 m between the bearings, the distance between the plane of 1<sup>st</sup> mass and the bearing at that end is 225 mm. Find the magnitude and orientation of counter masses to be added in planes at 75 mm from each bearing for the dynamic balancing of the shaft. The first and the second counter masses are to be added at radial distances of 75 mm and 40 mm respectively.

Or

21. An aero plane flying at 240 km/h turns towards left and completes a quarter circle of radius 60 m radius. The mass of rotary engine and the propeller of the plane is 450 kg with a radius of gyration of 320 mm. The engine speed is 2000 r.p.m. CW when viewed from the rear. Determine the gyroscopic couple on the aircraft and state its effect. In what way the effect changed when the aero plane turns towards right ?

Turn over

22. A machine mounted on springs and fitted with a dashpot has a mass of 60 kg. There are three springs, each of stiffness 12 N/mm. The amplitude of vibration reduces from 45 mm to 8 mm in two successive oscillations. Assuming that the damping force varies as the velocity, determine the damping co-efficient, the periodic time of damped vibrations, ratio of frequencies of damped and undamped vibrations.

Or

23. A machine having a mass of 100 kg is mounted on the spring and damper. The total stiffness of the springs is  $7.84 \times 10^5$  N/m while the damping ratio of the damper is 0.2. A harmonic force,  $F = 392 \sin(315t)$  N acts on the machine, find the dynamic amplitude of vibration, the transmissibility and the force transmitted to the foundation.
24. A shaft 1.5 m long, supported in flexible short bearings at the ends carries two wheels each of mass 50 kg. One wheel is situated at the centre of the shaft and the other at a distance of 375 mm from the centre towards left. The shaft is hollow of external diameter 75 mm and internal diameter 40 mm. The density of the material is  $7700 \text{ kg/m}^3$  and its modulus of elasticity is 200 GPa. Find the critical speed of the shaft, taking into account the mass of the shaft.

Or

25. A torsional system is shown in Fig. 4. Find the frequencies of torsional oscillations and positions of nodes. Also find the amplitudes of vibrations. Take,  $G = 84 \text{ GPa}$ .

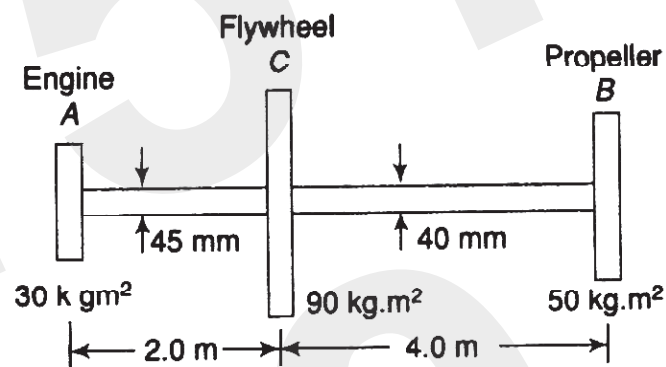


Fig. 4

(5 × 10 = 50 marks)

C 24616

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Printing Technology

PT 19 603—DIGITAL PRINTING AND PRE-PRESS

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Briefly explain X-graphy.
2. What is Hybrid printing systems ? Give its application.
3. What is Re-imageable master ? Explain.
4. Write a note computer to press.
5. Why digital workflow is required ? Briefly explain.
6. Give the advantages of irrational screening Process.
7. With a neat sketch, explain Thermal bubble Jet printer.
8. Why Piezo printer is required ?
9. Substrate used for Inkjet printing is very important - Justify.
10. Give the application of large format inkjet printer.
11. Explain the concept of Computer to Screen for Screen Printing.
12. Compare conventional and re-image able digital plate.
13. What is interpreter interaction in Digital pre-press ?
14. Give the application of SCSI ports.
15. For commercial application which inkjet is suitable ?—Justify.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer all question.*

*Each question carries 10 marks.*

16. What are the different Design of CTP ? Explain with suitable applications of the same.

*Or*

17. What is Computer to Cylinder for Gravure Printing ? Explain the need of such system and its advantages and dis-advantages.

18. How to generate re-image able surface with chemicals ? Explain the different steps involved.

*Or*

19. Explain the Concepts of Re- image able Master with material application/Ablation.

20. Explain Raster Image Processor integration and execution.

*Or*

21. Consider the case of a package printing unit and explain a suitable digital pre-press workflow for the same.

22. Explain the power supply control circuitry interface ports used in inkjet printers.

*Or*

23. Explain the developments of inkjet printers over the years and also give its application.

24. Compare large format inkjet printer with a Desktop inkjet printer

*Or*

25. Explain the on-going trends in inkjet printing.

(5 × 10 = 50 marks)



C 24599

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATIONS, APRIL 2022**

Electronics and Communication Engineering  
EC 19 604—ANTENNAS AND PROPAGATION

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Define beam solid angle of an antenna.
2. Distinguish between Effective Aperture and Physical Aperture of an antenna.
3. Explain antenna temperature.
4. Explain the concept of retarded potential.
5. Explain the principle of pattern multiplication.
6. Derive expressions and plot the pattern for the field radiated by two isotropic point sources fed with current of same magnitude and phase.
7. With neat diagrams explain the principle of operation of a Horn antenna.
8. Explain loop antenna and its applications.
9. Explain the effect of ground on antenna performance.
10. Explain fractal antenna.
11. List the major advantages and disadvantages of the patch antenna.
12. Describe frequency independent radiating structures with any *two* examples.
13. Explain with suitable diagrams, the ground wave, tropospheric wave and Ionospheric modes of wave propagations.
14. Explain about Ionospheric abnormalities.
15. Explain the multi path propagation effects.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

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

16. Explain directivity. Calculate the maximum directivity of an antenna whose radiation intensity is given by  $U = B_0 \sin^3 \theta$ .

*Or*

17. State and prove Reciprocity Theorem.

18. Design a seven element Dolph-Tschebyscheff array with inter element spacing of  $\lambda/2$ . The pattern is to be optimized with a side lobe level of 20 dB down the main lobe maximum.

*Or*

19. Plot the radiation pattern of a 4 element linear broadside array with isotropic point sources with spacing  $d = \frac{\lambda}{4}$ . Find BWFN of the array.

20. Explain any *two* different types of travelling wave antenna structures and their radiation patterns.

*Or*

21. Explain parabolic reflector antenna and the two major feed methods in the Parabolic reflector antenna with proper diagrams

22. Design a rectangular patch antenna on a dielectric substrate with dielectric constant of 2.65, height of 0.2 cm so as to resonate at 3 GHz.

*Or*

23. Give two examples for a frequency independent radiating structures. What is the effect of truncation on them? Explain the log periodic antenna with example.

24. Derive the expression for the field strength of Space Wave Propagation.

*Or*

25. Define skip distance, critical frequency and maximum usable frequency. Derive relation between critical frequency and maximum usable frequency.

(5 × 10 = 50 marks)

C 24611

(Pages : 4)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Mechanical Engineering

ME 19 604—OPERATIONS RESEARCH

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Indicate the difference between decision under risk and decision under uncertainty ?
2. Write the dual of the following primal L.P.P.

$$\text{Minimize } Z = 4X_1 + 5X_2 - 3X_3$$

$$\text{subject to } X_1 + X_2 + X_3 = 22$$

$$3X_1 + 5X_2 - 2X_3 \leq 65$$

$$X_1 + 7X_2 + 4X_3 \geq 120 \text{ and } X_1 \geq 0, X_2 \geq 0 \text{ and } X_3 \text{ unrestricted.}$$

3. Write short note on two person zero sums game.
4. Write the Kendal's notation for representing queuing models.
5. State the necessary and sufficient condition for the existence of a feasible solution to a transportation problem.
6. What are unbalanced transportation problems ? How are they solved ?
7. Consider M/M/1:α/FCFS queue. Parts arrive to a milling machine following a Poisson process at a rate of 10/hr. Machining time is exponentially distributed with a mean of 3 min. find (i) Average number of parts in the system ; and (ii) Average waiting time in Queue.
8. What do you mean by EOQ ?
9. What are EMV and EOL criteria.
10. Show that Assignment problems are particular cases of transportation problems.

**Turn over**

11. Define (i) Competitive game ; and (ii) Pay off matrix.
12. State the necessary and sufficient condition for the existence of a feasible solution to a transportation problem.
13. What do you understand by degeneracy in a transportation problem ? Explain how degeneracy in transportation problem may be resolved.
14. Define Operations Research and explain its characteristics.
15. The demand for an item is 10000 Units per year. Its Production rate is 1500 units per month. The holding ; cost is Rs. 20/unit/year and the set up cost is Rs. 800 per set up The shortage cost is Rs. 1,000 per unit per year. Find the EOQ.

(10 × 5 = 50 marks)

### Part B

*Answer all questions.*

*Each question carries 10 marks.*

16. A company makes two kinds of belts. Belt A is of high quality and Belt B is of tower quality. The respective profits are Rs. 8 and Rs. 6 per belt. Each belt of type A requires twice as much time as belt of type B and if all belts were of type B. the company could make 1000 belts per day. The supply of leather is sufficient for 800 belts (both A and B combined). Belt A requires a fancy buckle and only 400 such buckles are available per day. There are only 700 buckles a day available for type B. Formulate the problem as LPP.

*Or*

17. Use the graphical method to solve the problem :

$$\text{Maximize } Z = 10x_1 + 20x_2,$$

subject to

$$-x_1 + 2x_2 \leq 15$$

$$x_1 + x_2 \leq 12$$

$$5x_1 + 3x_2 \leq 45$$

and

$$x_1 \geq 0, \quad x_2 \geq 0.$$

18. Work through the simplex method step by step to solve the following problem :

$$\text{Maximize } Z = 4x_1 + 3x_2 + 6x_3,$$

subject to

$$3x_1 + x_2 + 3x_3 \leq 30$$

$$2x_1 + 2x_2 + 3x_3 \leq 40$$

and

$$x_1 \geq 0, \quad x_2 \geq 0, \quad x_3 \geq 0.$$

Or

19. Solve the LP problem :

$$\text{Minimize } Z = 20X_1 + 24X_2 + 18X_3$$

$$\text{subject to } 2X_1 + X_2 + X_3 \geq 30$$

$$X_1 + X_2 + X_3 \geq 20$$

$$X_1 + 2X_2 + X_3 \geq 24$$

$$X_1, X_2, X_3 \geq 0.$$

20. Use North West corner method to determine the basic feasible solution (Total cost) for the following transportation problem given in table 1 :

Table 1

Factories	Retail Agency					Capacity
	1	2	3	4	5	
A	1	9	3	36	51	50
B	24	12	16	20	1	100
C	14	33	1	23	26	150
Requirement	100	60	50	50	40	300

Or

21. Find the initial feasible solution and optimum solution of given transportation problem :

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	supply
O <sub>1</sub>	2	7	4	5
O <sub>2</sub>	3	3	1	8
O <sub>3</sub>	5	4	7	7
O <sub>4</sub>	1	6	3	14
Demand	7	9	18	

Turn over

4

22. Describe some methods which are useful for decision making under uncertainty.

*Or*

23. Solve the following game problem :

		Player B				
		B1	B2	B3	B4	B5
Player A	A1	2	- 4	6	- 3	5
	A2	- 3	4	- 4	1	0

24. Explain the various inventory models.

*Or*

25. A computer center has one multi-user computer. The number of users in the center at any time is ten. For each user, the time for writing and entering a program is exponential with mean rate 0.5 per hour. Once a program is entered, it is sent directly to the ready queue for execution. The execution time per program is exponential with mean rate 6 per hour. Assuming the mainframe computer is operational on a full-time basis, and neglecting the possibility of down-time, find :

- (i) The probability that a program is not executed immediately upon arrival in the ready queue.
- (ii) Average time until a submitted program completes execution.
- (iii) Average number of programs in the ready queue.

(5 × 10 = 50 marks)

C 24605

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Information Technology  
IT 19 604—DATA MINING

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Enumerate the key differences between database and data warehouse.
2. Mention the technologies applied by data mining approach and data to be mined.
3. List the applications of data mining.
4. Define data pre-processing. Explain the need for pre-processing in data mining.
5. Explain the activities involved in data transformation.
6. What is an attribute ? Mention the different types of attributes.
7. Give the pseudocode for 1R method.
8. Differentiate classification and prediction.
9. Define decision tree induction? How are decision trees used for classification ?
10. Explain the types of hierarchical clustering methods.
11. Mention the four widely used measures for distances in clusters.
12. Write the algorithm for k-means partitioning method.
13. Elaborate the types of approaches in text mining.
14. Enumerate the challenges in web for effective resource and knowledge discovery.
15. Outline the role of data mining in retail industry.

(10 × 5 = 50 marks)

**Part B**

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

16. (a) List and explain major issues in data mining regarding mining methodology, user interaction, performance and diverse data types.

*Or*

- (b) Describe the steps in the process of knowledge discovery with diagram.

**Turn over**

17. (a) Use a flowchart to summarize stepwise forward selection and stepwise backward elimination procedures for attribute subset selection.

*Or*

(b) Explain the types of visualization techniques and mention the usage of visualization in data mining.

18. (a) Explain the working of simple Bayesian classifier.

*Or*

(b) Demonstrate the basic algorithm for inducing a decision tree from training tuples.

19. (a) List and explain the challenges of clustering in data mining.

*Or*

(b) Explain the method of COBWEB in conceptual clustering.

20. (a) Discuss the various data mining software with its applications.

*Or*

(b) Elaborate the concept of web usage mining in web mining.

(5 × 10 = 50 marks)



C 24617

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Printing Technology

PT 19 604—TONE AND COLOUR ANALYSIS

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Briefly explain the concept of HSB colour model.
2. Standard observer is very important - Justify
3. Explain the principles of electronic scanning.
4. Write a note on pixel binary resolution.
5. Why colour correction is required ? Briefly explain.
6. Give the advantages of doing masking.
7. What is positive masking ?
8. Why dye retouching is required ?
9. Explain different types of densities.
10. Write a note on factors in color printing.
11. What is color calibration ?
12. Give the application of pantone color.
13. What is integral color masking ?
14. Mention the advantages of double overlay masking.
15. What is proportionality failure ?

(10 × 5 = 50 marks)

**Turn over**

**Part B**

16. What is colour management ? Explain the different modules and functions.

*Or*

17. What is the principle of Colour Management ? And Explain the function of CMM.

18. How to generate AM and FM screening works ? Give the advantages and applications respectively.

*Or*

19. Explain different types of scanner and explain its working and mention its advantages.

20. What is Digital Colour separation? Give its applications and advantages.

*Or*

21. Consider the case of a commercial printing unit and explain a ink colour sequence and the need of manual retouching.

22. Explain Gray Balance and Tone reproduction in Printing and Packaging industry.

*Or*

23. Explain Gray intensification and un-sharp masking in Printing industry

24. Explain Murray Davies Equation and Yule Nelson correction. Give the application and advantages respectively.

*Or*

25. For a security printing unit what are the different quality control aids required to maintain quality output ?

(5 × 10 = 50 marks)

C 24593

(Pages : 3)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATIONS, APRIL 2022**

Electrical and Electronics Engineering

EE 19 604—DIGITAL SYSTEM DESIGN

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

- I. 1 Explain functions and procedures.  
2 Describe the functions of a test bench.  
3 Differentiate Transport *vs* Inertial Delay.  
4 Write the concept of VHDL synthesis.  
5 List the VHDL features for sequential logic design.  
6 Write the VHDL code for a 3 to 8 decoder.  
7 Mention the dependency of output in combinational circuits.  
8 What are tri-state devices ? Explain.  
9 Explain about circuit timing.  
10 State the rules for state assignment.  
11 Generalize the differences between combinational and sequential circuits.  
12 Realize a JK flip-flop using D flip-flop.  
13 Draw the ASM chart for a full adder.  
14 Distinguish between FPGA and CPLD.  
15 Illustrate the XC4000 general interconnect structure.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer one full section from each questions.*

*Each question carries 10 marks.*

II. 16 a) Explain the types, constants and arrays are defined in VHDL ?

*Or*

b) Explain the functions and elements of Behavioural and Structural description in VHDL ?

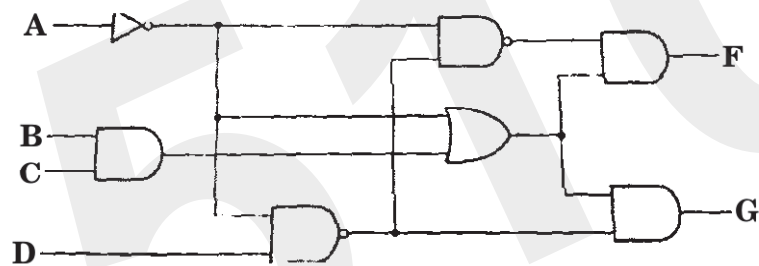
17 a) Write the VHDL code for 3-bit adder and comparator.

*Or*

b) i) Write about structural design elements with VHDL code.

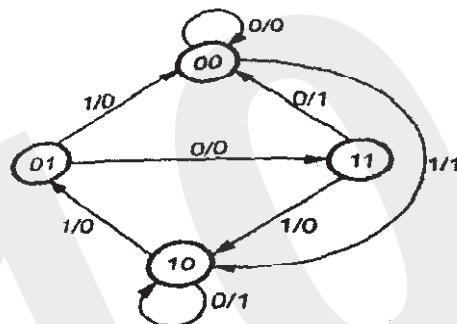
ii) Write the VHDL code for a 2 to 4 decoder in all 3 styles of modelling.

18 a) Explain the Analysis procedure. Analyze the following logic diagram.



b) Explain bubble-to-bubble logic design in detail.

19 a) Design the sequential circuit specified by the following state diagram using T flip-flops.



*Or*

b) What is meant by state diagram ? Define how state assignment is important in a sequential circuit design. Describe with a suitable example.

20. a) i) Explain the components and salient features of the ASM chart.  
ii) Draw the ASM chart for a parity generator.

*Or*

- b) With illustrations, describe the architecture of XC9500 CPLD family.

(5 × 10 = 50 marks)

C 24600

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022****Electronics and Communication Engineering  
EC 19 605 (D)—SATELLITE COMMUNICATION**

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Explain how to determine the look angle.
2. Explain orbital elements.
3. Define and explain sub satellite point.
4. Illustrate the GTO/AKM approach to geostationary orbit with neat sketches.
5. A LEO satellite is in circular polar orbit with an altitude  $h$  of 1000 km. A transmitter on the satellite has a frequency of 2.65 GHz. Use a mean earth radius value of  $r_e$  of 6378 km. Find the velocity of the satellite in the orbit.
6. Explain the Doppler shift.
7. Explain the principle of N-S control of a spinner satellite with neat diagram.
8. Explain the power systems used in the satellite.
9. Discuss about the orbit control system.
10. What are the factors contributing to noise in an earth station's receiving channel ?
11. Explain the reasons as to why the uplink frequency is different than the down link frequency.
12. Explain the uplink and downlink attenuation in rain.
13. Compare TDMA, FDMA and CDMA.
14. Explain the C-band and Ku band home TV.
15. Explain the satellite mobile system with necessary diagram.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

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

*Each question carries 10 marks.*

16. Briefly explain the elevation angle and the azimuth angle calculation.

*Or*

17. How to describe the orbit of a satellite with the help of Kepler's laws.

18. Explain the orbital effects in communication system performance.

*Or*

19. Explain the different methods to place satellite into geostationary orbit.

20. Differentiate the single conversion transponders and double conversion transponders with suitable sketches.

*Or*

21. Explain the different types of satellite antennas.

22. Explain and derive the equations for the link power budget.

*Or*

23. Explain the method to calculate the system noise temperature in satellite communication receivers.

24. Point out the comment on pros and cons of satellite system based on TDMA. Also explain the TDMA frame format in detail with relevant diagrams.

*Or*

25. Explain the operation of GPS in detail with necessary diagrams.

(5 × 10 = 50 marks)

C 24606

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Information Technology

IT 19 605 (A)—HUMAN COMPUTER INTERACTION

Time : Three Hours

Maximum : 100 Marks

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

1. Describe the capabilities and limitation of visual processing.
2. Explain the concept of Sensory Memory.
3. Exemplify chord keyboard as a Text Entry device.
4. Explain the process of Grouping and Structure in screen design and layout.
5. Depict the process of interaction design with block diagram.
6. Illustrate the throw-away prototyping in software prototyping.
7. State the purposes of User Interface Management systems.
8. Give technical description about the tool kits for fusing input and output behaviours.
9. Specify the concept of multi modal interaction.
10. Briefly explain Gestures and body language in Face to face communication.
11. Explain three state model of input devices in physical and device model.
12. Define Lexical, Syntactic and Syntactic with respect to Dialog in Computers.
13. Elaborate video conferences and communication in computer mediated communication.
14. Explain the role of argumentation tools in meeting and decision support systems.
15. What is the role of virtual collaborative environments in computer mediated communication ?

(10 × 5 = 50 marks)

**Turn over**



**Part B**

*Answer one full section from each question.*

*Each question carries 10 marks.*

16. a) Explain in detail about the display devices of the Computer for HCI and the various technologies involved in it.

*Or*

- b) Describe the various interaction styles involved in HCI.

17. a) Explain in detail about the problems in Usability Engineering.

*Or*

- b) Explain in detail about Navigation design in HCI.

18. a) Illustrate the concept of Evaluation through Expert Analysis.

*Or*

- b) Explain in detail about how a design can be made in HCI for persons with visual impairment.

19. a) Explain about Task-action grammar with respect to Linguistic model.

*Or*

- b) Explain in detail about Text based communication.

20. a) Illustrate with typical examples about ubiquitous computing applications research and its importance in Human Computer Interaction applications.

*Or*

- b) Explain about shared editors concept in shared applications.

(5 × 10 = 50 marks)

C 24612

(Pages : 3)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE (2019 SCHEME)  
[REGULAR] EXAMINATION, APRIL 2022**

Mechanical Engineering

ME 19 605 (A)—GAS DYNAMICS AND JET PROPULSION

Time : Three Hours

Maximum : 100 Marks

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

1. What is the basic difference between compressible and incompressible fluid flow ?
2. What are the different regions of compressible flow ?
3. A plane travels at a speed of 2400 km./hr. in an atmosphere of 5°C, find the mach angle.
4. Sketch the isentropic and adiabatic expansion process in P-V and T-S diagram.
5. What is choked flow ? State the necessary conditions for this flow to occur in a nozzle.
6. What is impulse function and give its uses ?
7. Calculate the strength of shock wave when normal shock appears at  $M = 2$ .
8. Give the difference between normal and oblique shock.
9. What is Prandtl-Meyer relation ? What its significance ?
10. Shown a normal shock in h-s diagram with the help of Rayleigh line and Fanno line.
11. State assumptions made to derive the equations for isothermal flow
12. What do you understand by choking in Rayleigh flow ?
13. Write the significance of Ram jet engine.
14. Write the significance of thrust augmentation.
15. Why after burners are used in turbojet engine ?

(10 × 5 = 50 marks)

**Turn over**

## Part B

Answer **one** full section from each question.

Each question carries 10 marks.

16. (a) The jet of a gas at 593 K ( $\gamma = 1.3$ ,  $R = 469 \text{ J/kg. K}$ ) has a Mach number of 1.2. Determine for local and stagnation conditions velocity of sound and enthalpy. What is the maximum attainable velocity of this jet ?

Or

- (b) In a settling chamber air at pressure of 5 bar and temperature is at 500 K. Determine the values of stagnation enthalpy, stagnation velocity of sound, maximum velocity of fluid, critical temperature, critical velocity of fluid and critical velocity of sound. Which type of flow has been assumed in the calculations ?

17. (a) The mach number and pressure at the entry of a subsonic diffuser is 0.9 and 4.165 bar. Determine the area ratio required and the pressure rise if the Mach number at the exit of diffuser is 0.20. Assume isentropic diffusion of air.

Or

- (b) Following quantities are given at the entry and exit of a passage :

Entry :  $P_1 = 2.07 \text{ bar}$ ,  $T_1 = 300 \text{ K}$ ,  $M_1 = 1.4$

Exit :  $M_2 = 2.5$

Assuming isentropic flow of an ideal gas ( $\gamma = 1.3$ ,  $R = 0.52 \text{ kJ/kg K}$ ) determine :

- (a) Velocity of sound at stagnation conditions.  
(b) The maximum velocity.  
(c) The Mach numbers  $M_1^*$  and  $M_2^*$ .  
(d) Temperature and pressure at exit.
18. (a) A jet of air at 275 K and 0.69 bar has an initial Mach number of 2.0. If it passes through a normal shock wave determine : (i) Mach number ; (ii) Pressure ; (iii) Temperature ; (iv) Density (v) Speed of sound ; and (vi) Jet velocity downstream of the shock.

Or

- (b) The stagnation pressure and temperature of air at the entry of a nozzle are 5 bar and 500 K respectively. The exit Mach number is 2.0 where a normal shock occurs. Calculate the following quantities before and after the shock: Static and stagnation pressures and temperature, air velocities and Mach numbers. What are the values of stagnation pressure loss and increase in entropy across the shock ?
19. (a) A gas ( $\gamma = 1.3$  and  $R = 0.46 \text{ kJ / kg. K}$ ) at a pressure of 70 kPa and temperature of 295 K enters a combustion chamber at a velocity of 75 m./sec. The heat supplied in a combustion chamber is 1250 kJ/kg. Determine the Mach number, pressure, and temperature of gas at exit.

*Or*

- (b) A long pipe of 25.4 mm. diameter has a mean coefficient of friction of 0.003. Air enters the pipe at a Mach number of 2.5 stagnation temperature 310 K and static pressure 0.507 bar. Determine for a section at which the Mach number reaches 1.2 : (a) Static pressure and temperature ; (b) Stagnation pressure and temperature ; (c) Velocity of air ; (d) Distance of this section from the inlet ; and (e) Mass flow rate of air.
20. (a) With a neat sketch, explain the working principle of Ram jet engine.

*Or*

- (b) Discuss about solid and liquid propellant rockets.

(5 × 10 = 50 marks)

C 24618

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Printing Technology

PT 19 605 (D)—BOOK PUBLISHING

Time : Three Hours

Maximum : 100 Marks

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

1. Write the structure of a publishing organization and explain the duties and responsibilities of each position.
2. What are the factors to be considered for estimation for the book publishing process ?
3. What are the factors which influence the economics of book publishing in the publishing process ?
4. What are the various promotion channels which are available for book publishing industry ?
5. Explain the economics of distribution which can be utilised for book publishing industry.
6. What are the different techniques available for book binding for book publishing ? Explain.
7. Explain the difference between laminating and varnishing and explain the merits and demerits of both the processes.
8. What are the aspects to be considered in digital publishing for a high end book publishing process ? Explain in detail.
9. What is web design and publishing and what is the scope of it in the current world ? Explain in detail.
10. Explain about the royalty system which can be utilised in a book publishing industry.
11. What are the various possibility in which can be made in a profit sharing agreement for a book publishing process between the author and the publisher ? Explain in detail.
12. What are the factors which will be considered in the illustration and artwork agreement in a book publishing process ? Explain in detail.

**Turn over**

13. Explain about the different types of agreements made between the author and the publishers.
14. What are the various print finishing operations which can be performed for making a good book ? Explain.
15. Explain the challenges faced in the exporter import of books publishing industry.

(10 × 5 = 50 marks)

### Part B

*Answer one full question from each section.*

*Each question carries 10 marks.*

16. a) Explain the roles and responsibilities of Commissioning editor and the desk editor in a publishing house.

*Or*

- b) How is writing textbook for children's and adult is different ? Explain in detail.

17. a) Explain the printing technique and its production process and the technical aspects of production to be considered for a book publishing process.

*Or*

- b) Explain the merits and demerits of direct promotion techniques male order advertising and subscription books.

18. a) Explain about the guidelines set by the university college and professional publishing council.

*Or*

- b) Explain about the guidelines set by the university college and professional publishing council.

19. a) What are the implications of the copyright act on book publishing ? Explain in detail.

*Or*

- b) Explain any two software which is necessary and widely used in the market for book publishing.

20. a) Explain in detail the agreement of the sale of translation rights.

*Or*

- b) What are the factors to be considered in a commission agreement framed between the publisher and the author in a book publishing process ? Explain in detail.

(5 × 10 = 50 marks)

C 24594

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATIONS, APRIL 2022**

Electrical and Electronics Engineering

EE 19 605 (B)—HIGH VOLTAGE ENGINEERING

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Explain the Breakdown mechanism in solid dielectrics.
2. Discuss the phenomena of electrical conduction in liquids.
3. Explain about partial discharge.
4. Describe the necessity of generating High DC voltage.
5. How is the wave front and wave tail times controlled in impulse generator circuits ?
6. How are rectangular current pulses generated for testing purposes ? How is their time duration controlled ?
7. Write the different forms of high voltages required for the testing of electrical apparatus.
8. How stray effect is reduced in shunt type of measurement ?
9. Explain the peak reading AC voltmeter ?
10. Explain the transformer ratio arm bridge for audio frequency range measurements.
11. How partial discharges are measured using straight detectors ?
12. Write a short note on radio interference measurements.
13. State and explain the phenomenon of over voltage.
14. Describe the characteristics of switching surges.
15. Explain the concept of lightning phenomenon.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

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

1. Explain the phenomenon of corona discharge and breakdown mechanism in non-uniform fields.

*Or*

2. Outline concept of anode and the cathode streamers ? Explain the mechanism of their formation and development leading to breakdown.
3. Explain simple voltage doubler and cascaded voltage doubler used for generation of high DC voltages

*Or*

4. Discuss elaborately the principle and operation of Cascaded transformers for generating high AC voltages.
5. Explain Electrostatic voltmeter used for measurement of high voltage with suitable diagram

*Or*

6. With a neat circuit and phasor diagram, explain the capacitance voltage transformer.
7. The lossless standard capacitor used in high voltage Schering Bridge has a value 100 pF. In a certain measurement, the other arms of the bridge at balance are (i) A resistance of 641 ohms and (ii) A capacitance of 0.052  $\mu\text{F}$  in parallel with a resistance of 2500 ohms. Determine capacitance and loss tangent of the specimen at 50 Hz.

*Or*

8. Explain with neat diagram the operation of pulse current measurement of partial discharges by straight detection technique.
9. Explain the terms attenuation and distortion of travelling waves propagating on overhead lines. What is the effect of corona on the transmission lines ?

*Or*

10. Describe in detail about testing of circuit breakers.

(5 × 10 = 50 marks)



C 24595

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Electrical and Electronics Engineering

EE 19 606 (F)—RENEWABLE ENERGY SYSTEMS

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

- I. 1 Summarize the Renewable energy sources.  
2 Compare Conventional and Non-Conventional Energy Resources.  
3 Classify non-conventional energy sources.  
4 Express the advantage of solar concentrators.  
5 Summarize the factor influencing solar power extraction.  
6 Express the estimation of average solar radiation.  
7 State the principle of OTEC system.  
8 Explain Advantages and Limitations of OTEC.  
9 Give the overall efficiency of an OTEC power plant.  
10 Illustrate the site selection factor for wind turbine.  
11 Explain main components of Wind power plant.  
12 Classify different types of Wind power plant.  
13 Explain the urban waste to Energy Conversion process.  
14 Point out the factors affecting biogas generation.  
15 Write about alcohol energy.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer any five questions.*

- II. 1 Explain the necessity of energy storage in renewable power harnessing.
- Or*
- 2 Generalize the present Indian and international energy scenario of conventional and RE sources.
- 3 Explain the stand-alone and grid connected Solar PV Systems.
- Or*
- 4 Discuss the various applications of solar electric systems.
- 5 Discuss the methods of OTEC power generation.
- Or*
- 6 Explain the principle of Tidal Power and components of Tidal Power Plant.
- 7 Describe with a neat sketch about Horizontal axis wind mills.
- Or*
- 8 Explain in detail about the pitch control and yaw control.
- 9 Explain the following types of biogas plants (i) KVIC ; and (ii) Janata model.
- Or*
- 10 How Small hydro power generation is classified and explain ?

(5 × 10 = 50 marks)

C 24601

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Electronics and Communication Engineering  
EC 19 606 (C)—ENTERTAINMENT ELECTRONICS

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. With a neat diagram, explain the process of recording on a compact disc.
2. Write short note on Hi-Fi Stereo reproducing system.
3. Explain the working of crystal microphone.
4. Explain the constructional features of condenser loudspeaker with figure.
5. How can sound reverberation be reduced while constructing an auditorium ?
6. Explain working of dynamic loudspeaker.
7. Write short note on equalization.
8. What is meant by impedance matching in PA system ?
9. List any *five* specifications of loud speakers in PA system.
10. Give a brief account on cable TV.
11. Explain the concept of luminance in TV.
12. How is synchronization ensured while scanning in a TV ?
13. To construct an electronic calculator, what are the various parts required ? Use necessary diagrams.
14. What is the principle of working of an induction cooker ?
15. How does an ATM act as an interface between the server and the user ? Explain.

(10 × 5 = 50 marks)

**Turn over**

**Part B**

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

16. Explain the construction, working principle and applications of dynamic headphones.

*Or*

17. With neat diagram, explain construction and working of carbon microphone.

18. With a neat diagram, explain about VHS tape transport mechanism.

*Or*

19. Explain the construction, working principle and applications of crystal loud speaker.

20. Explain in detail the following terms related with PA system - loudness, attenuation, sensitivity and intensity.

*Or*

21. What are the requirements of PA system to be implemented in a closed auditorium ?

22. What is meant by scanning ? Explain any *two* methods.

*Or*

23. Illustrate with the help of a neat block diagram, the working of a monochrome TV receiver.

24. What are the various parts of a mobile phone ? In detail, explain each.

*Or*

25. Explain the principle of operation and construction of a digital clock.

(5 × 10 = 50 marks)

C 24613

(Pages : 3)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Mechanical Engineering

ME 19 606 (B)—QUALITY ENGINEERING AND MANAGEMENT

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. What are the various parameters of quality cost ?
2. What is the meaning of employee involvement in quality engineering ?
3. With suitable example, briefly discuss about kaizen concept.
4. Briefly discuss about the 8 principles of QMS.
5. Write the significance of using affinity diagrams.
6. Draw and explain the 5 basic symbols of flowchart.
7. Elucidate the formula for Poisson distribution.
8. Write the procedure for dispersion measured in quality .
9. Enumerate the statistical tools. Mention any two software packages.
10. Mention the significance of control charts are used in Quality.
11. What is XR control chart ?
12. What is difference between CP and Cpk ?
13. Briefly discuss about double acceptance sampling methods.
14. What are the types of OC curve ? Elucidate it.
15. Why is reliability important in quality management system ?

(10 × 5 = 50 marks)

**Turn over**

**Part B**

*Answer one full section from each questions.*

*Each question carries 10 marks.*

16. a) Explain the importance of employee involvement with a suitable example.

*Or*

- b) What are Deming's 14 points ? Evaluate Deming's approach based on its strengths and weaknesses.

17. a) What is FMEA ? Discuss the various stages of FMEA with suitable sketch.

*Or*

- b) Define Pareto diagram. Explain how to construct it ? Where it is used ? Explain with suitable example.

18. a) Explain various measures of central tendency. What are their merits and demerits ?

*Or*

- b) What is binomial, normal and exponential distribution ? Elaborate each of them with suitable example.

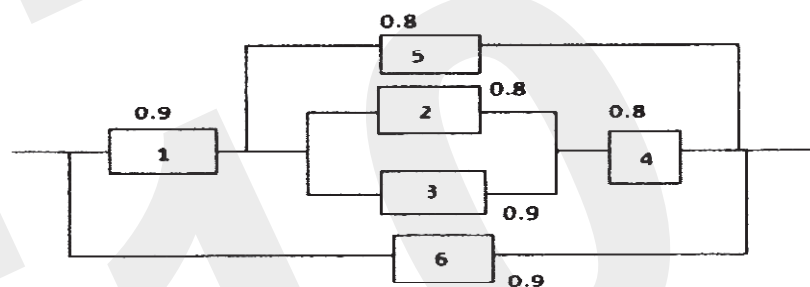
19. a) Elucidate the construction method of C-chart and state its applications.

*Or*

- b) (i) Explain the uses Control charts for attributes for  $p$ ,  $np$ ,  $c$  and  $u$  charts. (8 marks)

- (ii) Discuss about random and assignable causes of variations. (7 marks)

20. a) Calculate the reliability of the system shown using network reduction technique.



*Or*

b) A firm is to introduce an acceptance sampling scheme. Three alternative plans are considered.

Plan A : Take a sample of 50 and accept the batch if no nonconforming items are found, otherwise reject.

Plan B : Take a sample of 50 and accept the batch if 2 or fewer non-conforming items are found.

Plan C : Take a sample of 40 and accept the batches if no nonconforming items are found. Reject the batch if 2 or more are found. If one is found, then take a further sample of size 40.

If a total of 2 or fewer (out of 80) is found, accept the batch, otherwise reject.

- (a) Find the probability of acceptance for each of the plans A, B and C if batches are submitted containing (i) 1 % non-conforming (ii) 10 % non-conforming.
- (b) Without further calculation, sketch on the same axes the operating characteristic for plans A, B and C.
- (c) Show that, for batches containing 1 % non-conforming, the average number of items inspected when using plan C is similar to the number inspected when using plans A or B.

(5 × 10 = 50 marks)

C 24619

(Pages : 2)

Name.....

Reg. No.....

**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE [2019 SCHEME]  
{REGULAR} EXAMINATION, APRIL 2022**

Printing Technology

PT 19 606 (F)—DISASTER MANAGEMENT

Time : Three Hours

Maximum : 100 Marks

**Part A**

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

1. Write a note on Hazards in industry.
2. What is Risk and vulnerability analysis ? Explain.
3. What is Disaster preparedness ? Explain.
4. How to plan and predict disaster ?
5. What is Disaster Communication System ? Briefly explain.
6. Give the advantages of disaster safe design.
7. Why basic life support and causality handling is required ?
8. How to handle Hazardous chemicals ?
9. What is NDRF ? Explain.
10. Write a note on Flood Rescue.
11. Explain Cyclones and Volcanic eruptions.
12. What role does NGO play in Disaster management ?
13. Disaster Profile is very essential for Development of Country - Justify.
14. Give the scenario regarding the Response in tanker lorry accidents.
15. Make a conceptual plan to prevent any natural disaster.

(10 × 5 = 50 marks)

**Turn over**



**Part B**

16. What is Accidental disaster ? Explain any *one* type and also measures to prevent such accidents.
- Or*
17. Explain Air, Sea and road accidents. Also mention the steps to prevent the same.
18. Reconstruction and rehabilitation is a means of development - Justify with an suitable example / case
- Or*
19. What is Disaster prevention and mitigation ? Explain with a suitable example / case.
20. What is Structural and non-structural mitigation of disasters ? Explain with a suitable example / case
- Or*
21. Explain the role of science and technology institutions for disaster management in India.
22. Explain Transportation of causality and methods of rescue.
- Or*
23. Explain basics of Firefighting- Operation and fire protection systems.
24. NDRF teams and society should be synchronized during the occurrence of any disasters - Justify.
- Or*
25. Conceptualize any method or technique for controlling natural disaster.

(5 × 10 = 50 marks)