Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Material Science [ES220T]
Branch: EX

Time: 3:00 Hrs **Max Marks 70**

Note: 1. Attempt any five questions out of eight.
2. All question carry equal marks.

Q.1 (a) Write a short note on orbital magnetic dipole movement and angular momentum of simple atomic model.
(b) What do you mean by dipolar relaxation?

Q.2 (a) Explain Bragg's Law in details.
(b) Write short note on :(i) Bravais lattice (ii)Composite material.

Q.3 (a) What is Curie-Weiss law? Also explain spontaneous magnetization
(b) Explain spin magnetic moment in details.

Q.4 (a) Explain magnetic resonance in details.
(b) What do you mean by atomic structure? Also explain molecules and general bonding principles

Q.5 (a) Explain atomic interpretation of Ohm's law of conductor.
(b) Explain high conductivity and high resistivity material.

Q.6 (a) Explain conductors and also write properties of superconductor.
(b) Write short note on Linde's rule and Joule's rule.

Q.7 (a) Explain optical fibers and fiber materials?
(b) Write short note on Solar cell and Fuel cell?

Q.8 Write short note on following: i) carbon dioxide laser ii) Nd-YAG laser

Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Electrical Machine-I [EX-225T]
Branch- EX

Time: 3:00 Hrs **Max Marks 70**

Note : Attempt any five questions. All question carry equal marks.

Q.1 (a) Define efficiency and derive the condition for max. Efficiency.
(b) Explain different type of losses in transformer. How can they be minimized?

Q.2 (a) Why is the power factor of a single-phase induction motor low? Write the applications of 1-phase induction motor.
(b) Explain the working principle of Single phase transformer & derive e.m.f. equations.

Q.3 (a) Draw the equivalent circuit and phasor diagram for lagging and leading loads for single phase transformer?
(b)Draw and explain Scott connection of 3-phase transformer. Write Application of Scott connection.

Q.4 (a) Explain the parallel operation of transformer. Describe conservator and breather.
(b) Explain different types of connection used in 3 phase transformer?

Q.5 (a) How to make single phase induction motor self starting.
(b) Describe the construction, working principle of 3-phase induction motor with the help of neat diagram.

Q.6 (a) Draw the torque-speed characteristics of three phase induction motor(with effect of increasing resistance).
(b) What is Slip? Comparison of slip ring and squirrel cage motors.

Q.7 (a) How an Induction Motor is started? Why the Starter is used?
(b)Write a short note on Crawling and Cogging or Magnetic locking on induction machine.

Q.8 Write a short note on :– a) Polarity test b) Load test (sumpner's or back to back test)

Enrollment No…….

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Digital Electronics Logic Design [EX226T]
Branch-EX

Time: 3:00 Hrs **Max Marks 70**

Note: Attempt any five questions. All questions carry equal marks.

Q. 1. (a)State and explain Demerging's theorem.
(b)Design Excess-3 to BCD code converter? Design Binary to BCD code converter?

Q. 2. (a)Draw and explain Half adder and full adder circuit.
(b)Draw and describe the block diagram of PLA.

Q. 3. (a)What is universal gates? Implement all gates using NOR gate?
(b)What is encoder and decoder. Write important application of decoders.

Q. 4. (a)What is meant by the sequential circuit? Define latches and flip-flops. Explain the application of flip-flops
(b)Explain the working of SR flip flop using suitable diagram and discuss how it works as a latch?

Q. 5. (a)Discuss the working of D flip flop with the help of suitable diagram?
(b)Explain the J-K flip flop with circuit diagram and truth table.

Q. 6. (a)Define memory? Explain random access memory with timing waveform of memory cycle.
(b)What is a buffer register? What are the applications of counters and registers?

Q. 7. (a)Write short notes on the ramp type A/D converter. What are the Advantages and disadvantages of a dual slop A/D converter?
(b)What is ROM? Classify and explain its type

Q. 8. (a)Write short notes on:- (i) PISO (ii) SIPO
(iii)PIPO (iv)SISO

Enrollment No…….

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Power System-I [EX227T]
Branch- EX

Time: 3:00 Hrs **Max Marks 70**

Note: (i) Attempt any five questions. All question carry equal marks.
(ii) Assume suitable data if necessary and state them clearly.

Q.1 (a) Explain an overview of Electrical Energy Generation.
(b) Comparison of isolated versus interconnected power system. Discuss the Problems associated with modern large interconnected power system.

Q.2 (a) Write Conventional & non-conventional Sources of Energy.
(b) Short note on (any three) 1Diversity factor, 2capacity factor 3 utilization factor,4 load factor,5 demand factor 6 Load curves,7 base load,8 peak load

Q.3 (a) Explain Л models of transmission line.
(b) Define concept of GMR and GMD.

Q.4 (a) Define bundle conductor& Charging current. What are basic different between bundle conductor and Composite conductor?
(b) Define Skin and proximity effect. Explain its Causes and what is Ferranti effect?

Q.5 (a) Classification of cables. Define Grading of cables. Define: - Heating & Losses of cables - dielectric losses and sheath losses.
(b)Define transmission line and their representation. (Short, Medium & long)

Q.6 (a) Explain ABCD constants for symmetrical & asymmetrical network.
(b) Define Surge Impedance and loading. Define Tuned power lines.

Q.7 (a) How is the Transmission line Insulators classified? Causes of Failurers.
(b) What is stringing Chart? What is its utility?

Q.8 (a) What is Sag? What is stringing Chart? What is its utility?
(b) Explain 3 phase, 3wire&4wire distribution system.

Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
Control System [EX228T]
Branch-EX

Time: 3:00 Hrs **Max Marks 70**

Note : (i) Attempt any five questions.
(ii) Answer should be precise & to be point only.
(iii) Assume suitable data if necessary & state them clearly

Q.1 (a) Define transfer function?
(b) Explain open loop and closed loop systems with few examples for open and closed loop systems?

Q.2 (a) Explain Modeling of dynamic systems: Electrical and Mechanical.
(b) Apply Routh-Hurwitz criterion to the following equation and investigate the stability.
$S^4 + 10s^3 + 50s^2 + s(k+125) + 4K = 0$

Q.3 (a) What are the various rules for block reduction technique, Explain any seven of them?
(b) Compare block diagram reduction and Signal Flow Graph methods (any seven)?

Q.4 (a) Explain the effect of Type and order of transfer fuction on unit impulse signal, unit step signal, unit ramp signal.
(b) What is time response? What is transient and steady state response? What are the time domain specifications?

Q.5 (a) What is meant by frequency response of system? What are the advantages of frequency response analysis over time response system?
(b) Define the following term (1) Delay time (2) Rise time (3) Peak time (4) Maximum Overshoot (5) Settling time (6) Steady State error

OR

A second order system is given by $C(s)/R(s) = \frac{25}{s^2+6s=25}$ .Find its Rise time,Peak time,Peak overshoot and settling time if subjected to unit step input.Also calculate expression for its output response.

Q.6 (a) Explain Servomotors? Derive Transfer function of AC and DC Servomotors.
(b) Define and explain Steady state error & Error constants.

Q.7 (a) What is feedback? Explain different type of feedback employed in control system?
(b) What is meant by compensation? Define lag- Lead compensation with its transfer fuction. Write the advantages and disadvantages of lead compensation technique over lag compensation?

Q.8 Define (1) Gain crossover frequency (2) Phase crossover frequency (3) GM. & P.M. (4)Stability of the system.

Enrollment No……

Bachelor of Engineering
Fourth Semester Main Examination, June-2021
System Engineering [ES221T]
Branch-CS/EX/EC/IT/ME

Time: 3:00 Hrs **Max Marks 70**

Note: (i) Attempt any five questions out of eight.
(ii) All question carry equal marks.

Q.1 (a) Discuss origin of system Engineering.
(b) Explain system engineering fields.

Q.2 (a) Discuss structure of complex systems.
(b) Explain system environment, interfaces.

Q.3 (a) Discuss complexity of modem systems.
(b) Explain concept development and exploration.

Q.4 (a) Discuss system operational requirements.
(b) Explain Implementation of concept exploration.

Q.5 (a) Discuss reducing program risk.
(b) Explain functional analysis and design.

Q.6 (a) Explain prototype development as a risk mitigation technique.
(b) Explain test planning and preparation.

Q.7 (a) Explain operational test and evaluation.
(b) Write short notes on any two:
(i) Production operations
(ii) System engineering approaches
(iii) Integrating testing

Q.8 (a) Explain the concept of modeling systems.
(b) Explain the system life cycle phase and the product development life cycle phases.