Roll No. _____

5E1767

Total No. of Pages: 2

5E1767

5E1767
B. Tech. V - Sem. (Main) Exam., February - 2023
Electrical Engineering
5EE3 – 01 Electrical Materials

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____

2. NIL _____

PART – A

(Answer should be given up to 25 words only)   [10×2=20]
All questions are compulsory

Q.1 Why is skin effect important? Give two applications of it.

Q.2 Define dielectric loss and loss tangent.

Q.3 Which material have zero resistance and why?

Q.4 Why the mean of free path of a gas decrease at high pressure?

Q.5 How will the band gap of material affect the intrinsic carrier density?

Q.6 How are solids classified on the basis of bonding?

Q.7 Give two importance of defects in crystal.

Q.8 Why dielectric constant of water is 81 and for mica it is 6?

Q.9 How is superconductivity affected by magnetic field?

Q.10 Define relaxation time of electron in a conductor.

PART – B

(Analytical/Problem solving questions)   [5×4=20]
Attempt any five questions

Q.1 Define Hall effect. How is Hall potential developed?

Q.2 What is piezoelectricity? How it works to make crystal conduct electric current?

Q.3 Explain hysteresis loss in a ferromagnetic material. Give the factors that governs its magnitude.

Q.4 Give a brief account of the temperature dependence of resistivity in a metal and indicate why the increase in resistivity caused by an impurity is practically independent of temperature.

Q.5 Distinguish between 'doping' and 'alloying'. Which of the two should be resorted for changing the mechanical properties and why?

Q.6 Enumerate different types of semiconductors. Why Silicon (Si) is preferred over Germanium (Ge) for semiconductor material?

Q.7 Explain in detail the ohm's law for conductivity of metals.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)   [3×10=30]
Attempt any three questions

Q.1 What are the crystalline defects? Explain all types of defects in detail.

Q.2 (a) What do you mean by polarization in dielectrics? State electronic, ionic and molecular polarization in dielectric.

   (b) The relative dielectric constant of polystyrene is 3.5. What is the polarization produced when a 1.5mm thick sheet of polystyrene is subjected to 240V?

Q.3 What is Curie law, Curie temperature and Curie-Weiss law? What are the limitations of Curie-Weiss law?

Q.4 (a) Explain electron scattering. Also, explain how electron-electron scattering contribute to resistivity.

   (b) Define following terms of superconductivity –
   (i) Critical current density
   (ii) Meissner effect

Q.5 (a) What is the conductivity of a semiconductor sample having electron concentration of $5\times10^{18}m^{-3}$, hole concentration of $5\times10^{19}m^{-3}$, electron mobility of $2.0m^2v^{-1}s^{-1}$ and hole mobility of $0.01m^2v^{-1}s^{-1}$?

   (b) Explain the difference between the energy band diagram of metal, semiconductor and insulator.

Roll No. _____

5E1361

Total No. of Pages: 2

5E1361

5E1361
B. Tech. V - Sem. (Back) Exam., February - 2023
ESC Electrical Engineering
5EE3 – 01 Electrical Materials

Time: 2 Hours

Maximum Marks: 80
Min. Passing Marks: 28

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____

2. NIL _____

PART – A

(Answer should be given up to 25 words only)   [5×2=10]

All questions are compulsory

Q.1 What are electrical properties of material? Explain.

Q.2 What do you mean by chemical bonding?

Q.3 Differentiate between ionic bonding and covalent bonding.

Q.4 What is polarization?

Q.5 Explain Ohm's Law.

PART – B

Attempt any four questions

Q.1 Derive an expression of internal field in solid and liquids.

Q.2 Differentiate between electronic polarization, ionic polarizations and orientational polarization.

Q.3 What is crystalline state? Explain its defects in detail.

Q.4 Write short notes on -
(a) Relaxation time of electrons
(b) Curie Weiss Law

Q.5 Derive an expression of conductivity of intrinsic and extrinsic semiconductors.

Q.6 Explain atomic model interpretation of dielectric constant of monoatomic gases.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)   [2×15=30]

Attempt any two questions

Q.1 (a) What is Hall Effect in semiconductor? Derive the expression for hall coefficient R_H. Also give application of Hall Effect.

(b) The Hall Effect in measured on a semiconductor block of dimension $10mm \times 3mm \times 3mm$. The hall field ($E_H$) is $-.90$ mV/cm. When a current of 1.5 mA was carried lengthwise under an applied electric field (E_x) 40 mV and magnetic flux density (B_z) was 10^{-6} v sec/cm^2. Find out the number of charge carriers and hall angle.

Q.2 Write short notes on -
(a) Electron scattering
(b) Magnetic Material Classification
(c) Meissner Effect

Q.3 What are the various properties of Ferro-Electric materials? Give qualitative remarks on the dielectric constant of polyatomic molecules.

5E5041

B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical & Electronis Engineering
5EX1A Power Electronics
EE, EX

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*
Units of quantities used/calculated must be stated clearly.
Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT- I

Q.1 (a) Describe the switching characteristics of power MOSFET and IGBT and compare them. [8]

(b) Draw the V-I characteristics of a Thyristor and explain different operating regions. What is the effect of Gate current on the V-I characteristics of a Thyristor? [8]

OR

Q.1 (a) Explain two transistor model of Thyristor. Derive Anode current expression in terms of gate current and α_1, α_2. [8]

(b) Explain different commutation strategies of Thyristor. [8]

UNIT- II

Q.2 (a) Draw the gate characteristics of a SCR and explain its importance in the design of gate drive circuit. [8]

(b) Explain break over voltage, peak reverse voltage, holding current and latching current. [8]

OR

Q.2 (a) Explain different turn on methods for SCR. [8]

(b) Explain UJT relaxation oscillator along with voltage expressions. [8]

UNIT- III

Q.3 What are dual converters? Explain the operation of three-phase dual converter using circulating current mode of operation. How the firing angles of two converters controlled? [16]

OR

Q.3 (a) Explain the operation of Single-phase fully controlled bridge converter feeding highly inductive load and draw relevant output voltage and current waveform. [8]

(b) A single phase ac voltage controller is connected with a load of R = 10 Ω with input voltage of 230 V, 50 Hz supply. If the firing angle of SCR is 90^0 calculate, rms value of output voltage, power delivered to load, average value of Thyristor current and input power factor? [8]

UNIT- IV

Q.4 (a) Draw circuit and characteristics of three phase semi converter with RL and RLE load. Explain power factor improvement. [8]

(b) A single phase semi converter is delivering power to RLE load with R = 5Ω, L = 10 mH and E = 80 V. The ac source voltage is 230 V, 50 Hz. For continuous conduction, find the average value of output current for a firing angle of 60°. If one of the SCR is damaged and open circuited, find the new value of average output current on theassumption to continuous conduction. Also, sketch the output voltage and current waveforms? [8]

OR

Q.4 (a) How do you use PWM to converters? Explain operation of single full bridge converter with quasi-square wave pulse width modulation. [8]

(b) A single-phase PWM converter is fed from a 220 V dc supply and it is connected to a RL load with R=10 ohms and L=10 mH. Determine the total harmonic distortion in the load current. Assume width of each pulse is π/2 and the output frequency is 50 Hz. [8]

UNIT- V

Q.5 (a) Explain the operating principle of dc chopper with a suitable diagram. Draw the voltage and current waveforms of chopper. Derive expressions for average output voltage and rms output voltage. [12]

(b) List any four practical application of chopper. [4]

OR

Q.5 (a) Explain the different methods by which control of output voltage is obtained in choppers. [8]

(b) For a type A chopper, dc source voltage is 230 V, load resistance 10 Ω, drop across the switch is 2V and duty cycle 0.4. Calculate average and RMS value of output voltage and chopper efficiency. [8]

Roll No. _____   Total No. of Pages: 3

5E1760

5E1760

B. Tech. V - Sem. (Main) Exam., February - 2023
Electrical Engineering
5EE4-02 Power System - I
EE, EX

Time: 3 Hours   **Maximum Marks: 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

PART – A   [10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1   Give one difference between bulk power grid and micro grid.

Q.2   Give advantages of synchronous grid.

Q.3   Describe challenges associated with corona losses.

Q.4   Explain difference between auto transformers and tap changing transformer.

Q.5   Why are switching surges placed in substation?

Q.6   What do you understand by electrical faults?

Q.7   What is back up protection in power system?

Q.8   Give example of over current protection devices.

Q.9   Give application of VSC based DC link.

Q.10 Which type of generator is deployed in wind turbine?

PART – B   [5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1   Give outcome of course (Power System-I).

Q.2   Explain electrical transmission and distribution system by help of a neat

line diagram.

Q.3   Explain single phase equivalent of three phase transformer.

Q.4   Explain per unit system with its advantages.

Q.5   Describe lighting and switching surges.

Q.6   What is a circuit breaker? Give its application and explain its type.

Q.7   Explain fixed and variable speed wind turbines.

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

Q.1   Two generators rated at 10 MVA, 13.2 kV and 15 MVA, 13.2 kV respectively are connected in parallel to a bus. The bus feeds two motors rated at 8 MVA and 12 MVA respectively. The rated voltage of motor is 12.5 kV. The reactance of each generator is 15 % and that of each motor is 20 % on its own rating. Assume 50 MVA, 13.8 kV base and draw reactance diagram.

Q.2   Design a solar PV system model that is capable to supply both DC and AC load. Further plot its I-V and P-V characteristics.

Q.3   Give methods of symmetrical components and also state balanced and unbalanced faults.

Q.4   Find the disruptive critical voltage and visual corona voltage for a 3 phase 220 kV line consisting of 22.25 mm diameter conductor spaced in a 6 m delta configuration. The following date can be assumed. Temperature 25° C, Pressure 73 cm of mercury, surface factor 0.84, irregularity factor for local corona 0.72, irregurality factor for general corona (decided) 0.82.

Q.5   Design a structure of a power system for a bulk power grid and micro grid with all its essential equipment's.

	Roll No. _____	Total No. of Pages: 4

5E1362

B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical & Electronics Engineering
5EX4 – 02 Power System - I
EX, EE

Time: 3 Hours

Maximum Marks: 120
Min. Passing Marks: 42

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____ 2. NIL _____

PART – A

(Answer should be given up to 25 words only)   [10×2=20]

All questions are compulsory

Q.1 Why all overhead lines use ACSR conductors?

Q.2 Why we use Vacuum Circuit Breaker in High Transmission System and not Air Circuit Breaker?

Q.3 Why HVDC line do not require any reactive power compensation?

Q.4 What are the advantages of adopting EHV/UHV for transmission of AC electric power?

Q.5 What will happen when power factor is leading in distribution of power?

Q.6 What is infinite bus in power system?

Q.7 What is the difference between Isolator and Circuit Breaker?

Q.8 How can we reduce the effect of corona?

Q.9 What is the difference between grid station and substation?

Q.10 For a fault at a given location, rank the various faults in the order of severity.

PART – B

(Analytical/Problem solving questions)   [5×8=40]

Attempt any five questions

Q.1 Two generators rated 10MVA, 13.2kV and 15MVA, 13.2kV are connected in parallel to a bus bar. They feed supply to 2 motors of inputs 8MVA and 12MVA respectively. The operating voltage of motors is 12.5kV. Assuming the base quantities as 50MVA, 13.8kV, draw the per unit reactance diagram. The percentage reactance for generators is 15% and that for motors is 20%.
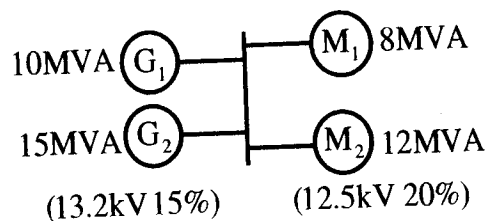
Q.2 Derive the expression for the capacitance of three phase unsymmetrical spaced transposed overhead transmission line.

Q.3 Discuss series and shunt compensation of a transmission line.

Q.4 Write short notes on the following –

(a) Insulation coordination

(b) Radial and mesh distribution networks

Q.5 Draw a simple scheme of HVDC converter station and describe briefly components of the converter station.

Q.6 A synchronous motor, having a power consumption of 50kW, is connected in parallel with a load of 200kW, 0.8p.f. lagging. The excitation of the motor is adjusted until combined power factor becomes 0.9 lagging. Determine the kVA input and power factor of synchronous motor.

Q.7 Differentiate between synchronous and asynchronous grid.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)   [4×15=60]

Attempt any four questions

Q.1 (a) Define the term feeder, distributor and service mains.

(b) What is the percentage saving in feeder copper, if the line voltage in a 2-wire DC system is raised from 250 volts to 500 volts for the same transmitted over the same distance and having equal power loss?

Q.2 (a) Explain different types of AC transmission line. Derive the expression of ABCD constants for nominal T configured Medium Transmission line.

(b) The ABCD line constant of a 220 kV lines are:

A = D = 0.94 $\angle 1°$; B = 130 $\angle 73°$; C = 0.001 $\angle 90°$

If the sending end voltage (Vs) of the line for a given load delivered at nominal voltage is 240kV, then determine % voltage regulation of line.

Q.3 (a) Derive an expression for fault current for double line-to-ground (LLG) fault by Symmetrical Components Method.

(b) A 3-phase, 11kV, 10MVA alternator has sequence reactances of $X_0 = 0.05$p.u., $X_1 = 0.15$p.u. and $X_2 = 0.15$p.u. If the generator is on no load, find the ratio of fault currents for L-G fault to that when all the 3-phases are dead short-circuited.

Q.4 (a) What is the difference between On-grid and Off-grid solar power?

(b) Discuss in detail the principle of DC Link control.

Q.5 (a) Explain the working of SF_6 gas circuit breaker.

(b) An 11kV, 3-phase transmission line has a resistance of 1.5ohm and reactance of 4ohm per phase. Calculate the percentage regulation and efficiency of the line when a total load of 5000kVA at 0.8 lagging power factor is supplied at 11kV at the distant end.

5E5044

5E5044

B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical Engineering
5EE4A Database Management System
EE, EX

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly. Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL _____   2.   NIL _____

UNIT- I

Q.1 (a) Explain DBMS architecture and its types.   [10]

(b) Write advantages of DBMS system.   [6]

OR

Q.1 (a) Write features of ER model and explain ER diagram.   [8]

(b) Explain Generalization v/s Specialization.   [8]

UNIT- II

Q.2 (a) Explain the insertion, deletion, updation and repetition anomalies in 1 NF.   [8]

(b) Define BCNF. How does it differ from 3NF?   [8]

Q.2 (a) Write difference between relational algebra and relational calculus. [8]

(b) Explain different unary and binary operations of relational algebra. [8]

UNIT- III

Q.3 Differentiate between DML and DDL and explain Integrity Constraints. [16]

OR

Q.3 Write short notes on -

(a) Dynamic SQL [8]

(b) JDBC [8]

UNIT- IV

Q.4 What is File Organization in RDBMS? Explain Sequential and Indexed File Organization. [16]

OR

Q.4 What is Multi-key File Organisation? Explain Inverted and Multi-list File Organization. [16]

UNIT- V

Q.5 (a) What is transaction? What are the properties of transactions? [6]

(b) Explain Serializabiltiy and its types. [10]

OR

Q.5 Write short note on :

(a) Concurrency Control [8]

(b) Deadlock Handling [8]

5E1761

B. Tech. V - Sem. (Main) Exam., February - 2023
Electrical Engineering
5EE4 – 03 Control System
EE, EX

Time: 3 Hours   **Maximum Marks: 70**

Instructions to Candidates:

   Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.

   Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

   Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

PART – A

(Answer should be given up to 25 words only)   [10×2=20]

All questions are compulsory

Q.1   Draw the block diagram of closed loop and open loop control system.

Q.2   Explain the difference b/w order and type of the system.

Q.3   Define absolute & relative stability.

Q.4   Explain the magnitude criterion of root locus technique.

Q.5   Explain the lag compensator.

Q.6   Explain the concept of observability.

Q.7   Explain the singular points.

Q.8 What is the limitation of transfer function approach?

Q.9 Explain the gain margin and phase margin.
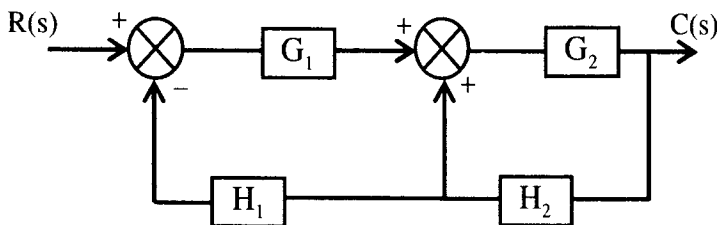
Q.10 Define the Cayley-Hamilton Theorem.

PART – B

(Analytical/Problem solving questions)   [5×4=20]

Attempt any five questions
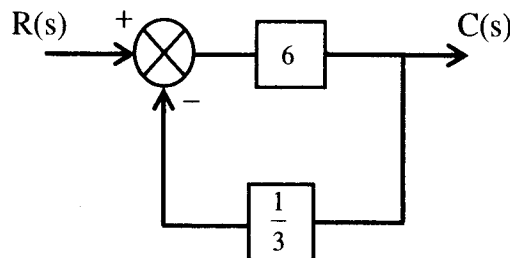
Q.1 Find the overall gain $\frac{C(s)}{R(s)}$ of the given block diagram -

Q.2 The state equation of an LTI system is $X = \begin{bmatrix} -3 & 0 \\ 0 & -3 \end{bmatrix} X + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$

Find the state transition matrix for the above state equation.

Q.3 Find the closed loop gain of the system shown in figure below -

Q.4 Find the phase margin of a system having the loop transfer function $G(s)H(s) = \frac{2\sqrt{3}}{s(s+1)}$

Q.5 Draw the Nyquist plot of the transfer function, $G(s) = \frac{100}{(s+2)(s+4)(s+8)}$

Q.6 Check the observability : $\frac{Y(s)}{U(s)} = \frac{1}{s^2+2s^2+3s+4}$

Q.7 Explain the minimum phase, non-minimum phase and all pass transfer function.

PART – C

Attempt any three questions

Q.1 Draw the Bode plot of $G(s) = \dfrac{4}{s(1+0.5s)(1+0.08s)}$
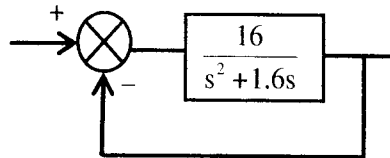
Q.2 The open loop transfer function of a unity feedback system is $G(s) = \dfrac{K}{s(s^2+s+2)(s+3)}$

Find the range of K for which the system is stable?

Q.3 Given the system differential equations $\ddot{y} + y - y^3 = 0$. Sketch the phase plane around the equilibrium point.

Q.4 Draw the root locus plot of open loop transfer function $GH(s) = \dfrac{K}{s(s+4)(s+6)}$

Q.5 A unity feedback control system is -

By using derivative control the damping ratio is to be made 0.8. Determine the value of T_d and compare t_r, t_p & M_p -

(a)   Without derivative control

(b)   With derivative control

5E1363

Roll No. _____   Total No. of Pages: 3

5E1363

B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical & Electronics Engineering
5EX4 – 03 Control System
EX, EE

Time: 3 Hours

Maximum Marks: 120
Min. Passing Marks: 42

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. <u>NIL</u>   2. <u>NIL</u>

PART – A

<u>(Answer should be given up to 25 words only)</u>   [10×2=20]

<u>All questions are compulsory</u>

Q.1 What is meant by steady state error?

Q.2 What is the control system?

Q.3 Define the initial and final value theorem.

Q.4 Distinguish between type and order of a system.

Q.5 What are the basic elements used for modeling translation system?

Q.6 What are the necessary conditions for stability?

Q.7 Define the term controllability and observability.

Q.8 What are the effects adding open loop poles and zero on the nature of the root locus and on system?

Q.9 List the main properties of a state transition matrix.

Q.10 How an automatic coffee maker machine is an example of open loop control system?
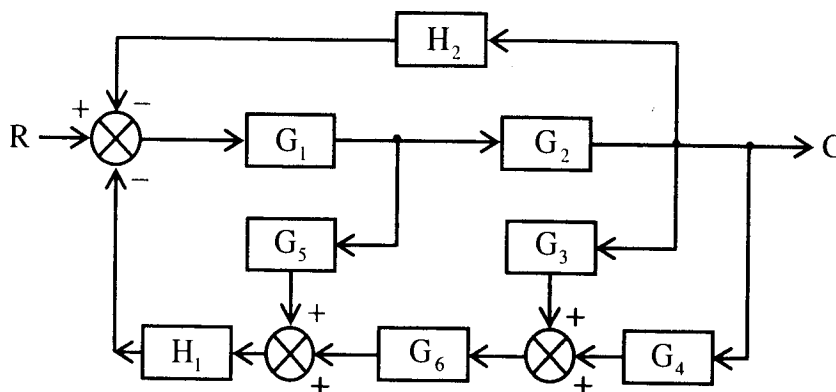
PART – B

(Analytical/Problem solving questions)   [5×8=40]

Attempt any five questions

Q.1 Determine the overall transfer function using block diagram reduction techniques for the block diagram as shown in figure.

Q.2 The open loop transfer function of a unity feedback control system is given by -

$$G(s) = \frac{k(s+2)}{s^3 + \beta s^2 + 4s + 1}$$

Determine the value of k and β such that the closed loop unit step response has $\omega_n = 3$ rad/sec and $\xi = 0.2$.

Q.3 Determine the stability of a closed loop control system whose characteristics equation is given as –

$$s^5 + s^4 + 2s^3 + 2s^2 + 11s + 10 = 0$$

Q.4 Explain the co-relation of frequency domain with time domain.

Q.5 Sketch the polar plot for the given transfer function –

$$G(s) = \frac{1}{(1+s)^2}$$

Q.6 Explain the Ziegler – Nichols rules for tuning the PID controllers.

Q.7 Check observability of the system given below –

$$\dot{x}_1 = -2x_1 + x_2 + u$$
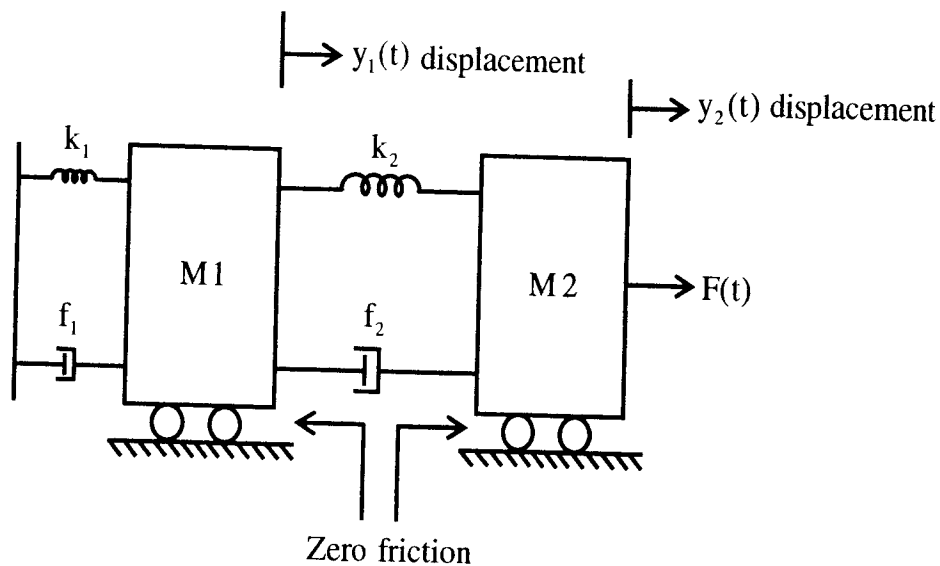
$$\dot{x}_2 = -2x_2 + u \text{ and } y = x_1 + x_2$$

PART – C

Attempt any four questions

Q.1 Draw the mechanical circuit diagram for the system as given below in figure and write the system equations for force – voltage and force – current analogy. Also, draw the F – V and F – I analogy circuit.

Zero friction

Q.2 Define and derive the mathematical expressions for rise time, peak time, peak overshoot and settling time for the second order system.

Q.3 A unity feedback system has a loop transfer function $G(s) = \dfrac{(s+2)}{(s+1)(s-1)}$. Use Nyquist criteria to determine the system stability in the closed loop configuration.

Q.4 Obtain the state space equations for the transfer function given as $G(s) = \dfrac{10(s+1)}{(s+4)(s+2)^2}$.

Q.5 Explain in detail the output regular and the tracking problems.

5E5043

5E5043

5E5043
B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical & Electronics Engineering
5EX3A Control Systems
EE, EX

Time: 3 Hours   **Maximum Marks: 80**
                                           Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**.*
*All questions carry **equal** marks. Schematic diagrams must be shown wherever*
necessary. Any data you feel missing suitably be assumed and stated clearly.
Units of quantities used/calculated must be stated clearly.
Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT- I

Q.1   (a)   What is control system? Explain the basic architecture of open loop

and closed loop control system. Also give merits and demerits of both

the system.   [8]

      (b)   Verify the following statements –   [8]

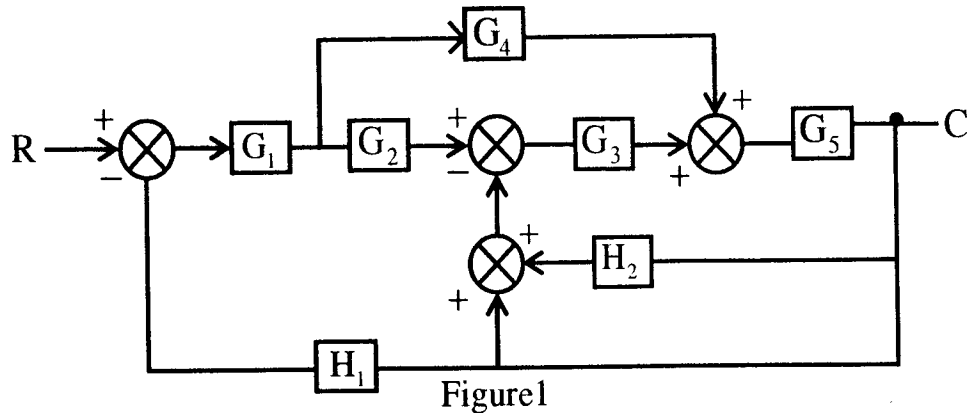   (i)   An automatic coffee maker is an example of open loop control

                   system.

            (ii)   Controlling of traffic by policeman is an example of closed loop

                   control system.

OR

Q.1 (a) Simplify the block diagram shown in figure 1. [8]

Figure1

(b) Explain the term multi-variability in control system. What is its significance in system? [8]

UNIT- II

Q.2 Derive the expression for steady state error for various inputs (unit step, unit ramp and unit parabolic) and systems (Type – 0, Type – 1 and Type – 2). [16]

OR

Q.2 (a) A unity feedback control system has $G(s) = \frac{1}{s(s+2)}$. The input of the system is given by $r(t) = 2t + 3t + 3t^3$. Determine the general error coefficient and steady state error. [8]

(b) Determine the time response of first order control system. [8]

UNIT- III

Q.3 (a) Explain the importance of control system components. [8]

(b) Explain the principle operation of ac servomotor. [8]

Q.3 Sketch the Root – Locus plot for the open loop transfer function is

$G(s)H(s) = \frac{K(S^2+4)}{s(s+2)}$. Calculate the value of K at –

(a) Breakaway point

[8]

(b) S = 0.69 + j0.9

[8]

UNIT- IV

Q.4 The transfer function of a unity feedback control system is

$G(s)H(s) = \frac{720(s+1.25)}{s(s+10)(s^2+2s+9)}$. Determine the closed loop stability using

Bode Plot method.

[16]

OR

Q.4 Write technical note on –

(a) Nicholas Chart

[8]

(b) Gain and Phase Margin

[8]

UNIT- V

Q.5 Which type of compensator improves the steady state error and transient response? Explain in detail.

[16]

OR

Q.5 Write technical note on PID Controller.

[16]

5E1762

5E1762
B. Tech. V - Sem. (Main) Exam., February - 2023
Electrical Engineering
5EE4 – 04 Microprocessor
EE, EX

Time: 3 Hours 　　　　　　　　　　　　　　　**Maximum Marks: 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____ 　　　　　　　　2. NIL _____

PART – A

(Answer should be given up to 25 words only) 　　　**[10×2=20]**

All questions are compulsory

Q.1　In 8085 microprocessor what in the size of data, address, memory word and memory capacity?

Q.2　What is RS232 and its signals?

Q.3　What is the difference b/w micro-processor and micro-controller?

Q.4　Define Program Counter and Stack Pointer.

Q.5　Describe embedded system.

Q.6　Differentiate Synchronous and Asynchronous communication.

Q.7　Write short note on PSW.

Q.8　List out the various addressing mode for 8051.

Q.9 What you mean by memory wait states?

Q.10 Why we use sensors for interfacing with 8051?

PART – B

(Analytical/Problem solving questions)   [5×4=20]

Attempt any five questions

Q.1 Draw the pin diagram of 8051. Explain working of each signal.

Q.2 Discuss about the arithmetic and control instruction set for 8051 with suitable example.

Q.3 Explain interfacing circuit for 16×2 LCD display with 8051 microcontroller.

Q.4 Explain the Special Function Register (SFR).

Q.5 Compare 8-bit, 16-bit and 32-bit microcontroller.

Q.6 What is the use of clock and reset circuit in 8051? Explain in detail.

Q.7 What is protocols? Explain protocols like Bluetooth and Zig-bee.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)   [3×10=30]

Attempt any three questions

Q.1 Draw the architecture of 8051 microcontroller. Explain each block in detail.

Q.2 Explain the sensor and memory (external) interfacing with 8051 with neat circuit diagram.

Q.3 What is addressing modes? Explain each and every addressing modes used in 8051 with suitable example.

Q.4 Explain different types of Analog to Digital converters (ADC).

Q.5 Write short note on -

(A) SPI

(B) IIC(I2C)

5E1364

5E1364

B. Tech. V - Sem. (Main & Back) Exam., February - 2023
Electrical & Electronic Engg.
5EX4-04 Microprocessor
EE, EX

Time: 3 Hours

Maximum Marks: 120
Min. Passing Marks: 42

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

PART – A

(Answer should be given up to 25 words only)   [10×2=20]

All questions are compulsory

Q.1 What is the function of ALE in 8 bit microprocessor?

Q.2 What is the need of memory interfacing?

Q.3 State the difference between direct and indirect addressing.

Q.4 What is the function of program counter in 8051 microcontroller?

Q.5 List the alternative functions assigned to Port 3 pins of 8051 microcontroller.

Q.6 Mention the size of DPTR and Stack Pointer in 8051 microcontroller.

Q.7 List the 8051 interrupts with its priority.

Q.8 State the basic principle of Flash type ADC.

Q.9 What is the operation of the given 8051 microcontroller instruction XRL A, direct?

Q.10 What are the different operations performed by Boolean variable instructions of 8051?

PART – B

(Analytical/Problem solving questions)   [5×8=40]

Attempt any five questions

Q.1 What is the difference between microprocessor and microcontroller?

Q.2 Draw the internal architecture of 8051 and explain briefly.

Q.3 Discuss the various timer modes supported by 8051.

Q.4 What is DAC? Explain R/2R ladder type DAC in detail.

Q.5 Draw the pin diagram of 8 bit microprocessor and explain the function of external initiated operations.

Q.6 Write the codes in 8051 assembly language for the following -

 (i) Make the lower order nibble of the byte at address 34 H to all 1's and do not change the higher order nibble.

 (ii) Swap the contents of register R_3 and R_4 in bank 2.

Q.7 Compare RS-422A and RS-423A serial data standard.

PART – C

Attempt any four questions

Q.1 What is special function registers? Explain each register with its format and functions.

Q.2 How the sensor can be interfaced using microcontroller? Explain in detail using suitable example and draw its block diagram also.

Q.3 Draw the diagram to interface a stepper motor with 8051 Microcontroller and explain. Also, write an 8051 assembly language program to run the stepper motor in both forward and reverse direction.

Q.4 What is communication protocol? Explain I2C and Zig-bee in detail.

Q.5 Explain following instruction of 51 family microcontrollers -

(i)   MOV A, 55H   (ii)   MOV A, #55H

(iii) MOV @R0, #44H   (iv)   XCH A,R1

(v)   XCHD A, R2   (vi)   CPL A

5E5045

5E5045

B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical & Electronis Engineering
5EX5A Transmission & Distribution of Electrical Power
EE, EX

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT- I

Q.1 (a) Explain the radial and ring main distribution system.   [8]

(b) Draw and explain the structure of electrical power system indicating the voltage level in each transmission level.   [8]

OR

Q.1 (a) Show that at higher voltage and higher power factor the efficiency of the transmission line will be increased. What are the limiting factors of the transmission line?   [8]

(b) Compare the cross section area of a conductor for DC two wire systems and single phase AC system assuming equal length, equal power and equal losses.   [8]

UNIT- II

Q.2 (a) What is meant by disruptive critical voltage and visual critical voltage? State the effect of conductor size, spacing and condition of the surface of the conductor on these voltages. [8]
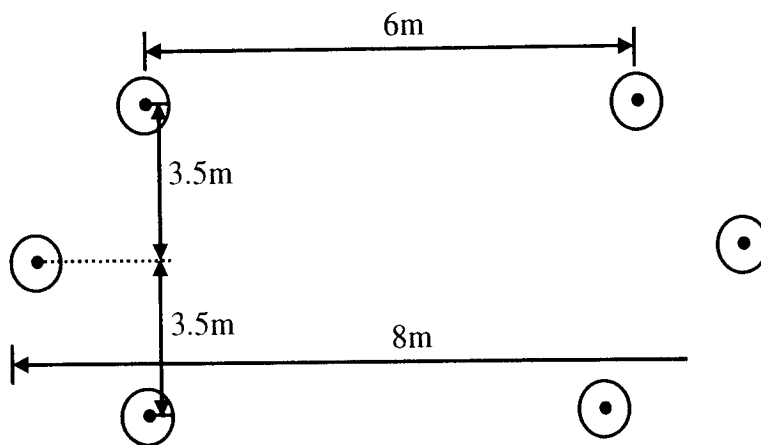
(b) Derive the expression for sag of a line supported between two supports of same height. [8]

OR

Q.2 Calculate the capacitance per phase of three phase double circuit line as shown in below figure. The diameter of the conductor is 2.2 cm. Assume the line is completely transposed. [16]

UNIT- III

Q.3 (a) Find the flux linkage of single phase two wire line and derive an expression for inductance per unit length. [8]

(b) Explain skin effect and proximity effect in detail. [8]

OR

Q.3 (a) Derive the capacitance of three phase overhead line. [8]

(b) Deduce the expression for capacitance of three phase transmission line with unsymmetrical spacing (transposed conductor). [8]

UNIT- IV

Q.4 (a) Explain various factors affecting corona loss.   [8]

     (b) Explain Ferranti effect in detail.   [8]

OR

Q.4 Write brief note on equivalent circuit and performance of long transmission line.   [16]

UNIT- V

Q.5 (a) Explain constructional features of various types of cables.   [8]

     (b) Explain two methods of grading of cables with necessary diagram. [8]

OR

Q.5 (a) Derive formula for the electric stress in single core cable. Where it is maximum?   [8]

     (b) Define string efficiency and explain different method of improving string efficiency.   [8]

5E1768

5E1768

B. Tech. V - Sem. (Main) Exam., February - 2023
Electrical Engineering
5EE4 – 05 Electrical Machine Design

Time: 3 Hours   **Maximum Marks: 70**

Instructions to Candidates:

   Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.

   Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

   Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

PART – A
(Answer should be given up to 25 words only)   [10×2=20]
All questions are compulsory

Q.1 Explain high conductivity material and high resistivity of materials.

Q.2 Name the basic structural parts of an electromagnetic rotating machine.

Q.3 Write short note on window space factor of the transformer.

Q.4 Define regulation of transformer with their mathematical equation and phasor diagram also.

Q.5 What is end ring current in induction motor? Draw the waveform of squirrel cage rotor.

Q.6 What is cogging? How is it avoided in induction motor?

Q.7 In synchronous machines how can we estimate the air gap length?

Q.8 Define shape of pole face in synchronous machines.

Q.9 Explain hybrid and optimization method in CAD.

Q.10 What is difference between PMSM and BLDC machines?

PART – B
(Analytical/Problem solving questions) [5×4=20]
Attempt any five questions

Q.1 Make a brief note on temperature rise and insulating material in electrical machine design.

Q.2 What do you mean by rating of machines? Explain transformer cooling methods in detail.

Q.3 The ratio of flux to full load mmf in a 400kVA, 50Hz, single phase core type power transformer is 2.4×10^{-6}. Calculate the net iron area and window area of the transformer maximum flux density in the core is $1.3 wb/m^2$, current density $2.7 A/mm^2$ and window space factor 0.26. Also, calculate the full load mmf.

Q.4 Derive the expression for output equation of induction motor.

Q.5 A 3 phase 2 pole, 50Hz squirrel cage induction motor has a rotor diameter 0.20m and core length 0.12m. The peak density in the air gap is $0.55 wb/m^2$. The rotor has 33 bars, each of resistance $125\mu\Omega$ and a leakage inductance $2\mu H$. The slip is 6%.

Q.6 Explain the design of field winding in synchronous machines using wire wound coil.

Q.7 In Computer Aided Design what are the limitations of traditional designs?

PART – C
(Descriptive/Analytical/Problem Solving/Design Questions) [3×10=30]
Attempt any three questions

Q.1 State and explain the specific electrical loading and the choice of electrical loading.

Q.2 Write short note on –
(a) No load current of single phase transformers
(b) No load current of three phase transformers
(c) Magnetize volt ampere ratio

Q.3 What is short circuit (blocked rotor) current? Explain the mathematical expression using stator and rotor resistance in detail.

Q.4 (a) Explain different approaches used in Computer Aided Design with the help of suitable flowcharts.

(b) Define specific constraints and objective function in CAD.

Q.5 Find the main dimensions of a 100MVA, 11kV, 50Hz, 150rpm, 3 phase water wheel generator. The average gap density is $0.65 wb/m^2$ and ampere conductors per meter are 40,000. The peripheral speed should not exceed 65m/s at normal running speed in order to limit the run-away peripheral speed.

5E1365

5E1365

B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical Engineering
5EE4-05 Electrical Machine Design

Time: 3 Hours   **Maximum Marks: 120**
                                         Min. Passing Marks: 42

Instructions to Candidates:

    Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

    Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

    Use of following supporting material is permitted during examination.
    (Mentioned in form No. 205)

1. **NIL** _____   2. **NIL** _____

PART – A   [10×2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1   What are the factors that affect the size of rotating machines?

Q.2   What do you understand by cogging?

Q.3   How iron loss can be reduced in transformers?

Q.4   What are the various coding methods used for transformers?

Q.5   What are the various factors considered in designing of electrical machines?

Q.6   Why damper windings are used in synchronous machines?

Q.7 Define specific electric loading.

Q.8 Mention the advantages and disadvantages of using open slots in machines.

Q.9 What are the advantages of using synthesis design method in CAD?

Q.10 Mention various duty cycles of motor.

PART – B [5×8=40]

(Analytical/Problem solving questions)

Attempt any five questions

Q.1 Explain the synthesis method of computer aided design with a neat flowchart. Also, mention its advantages and disadvantages.

Q.2 Derive the expression for output equation of induction motor.

Q.3 A 3-phase, 4-pole, 50 Hz induction motor has 24 stator slots and 28 rotor slots. Prove that it has a tendency to run as a synchronous motor at 214.3 rpm.

Q.4 What do you mean by Short Circuit Ratio (SCR) with reference to synchronous generator. Explain the factors being affected by SCR.

Q.5 Explain the construction of synchronous machine with neat diagrams.

Q.6 Explain the necessary steps for the design of wound rotor of an induction motor.

Q.7 State and explain the specific magnetic loading and the choice of magnetic loading.

PART – C

[4×15=60]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any four questions

Q.1 Mention the various steps of determination of main dimensions for core, yoke and window of transformer. Explain the design procedure of low-voltage and high-voltage winding of a transformer.

Q.2 What do you understand by CAD analysis? Explain different approaches used in computer aided design with the help of suitable flowcharts.

Q.3 Estimate the main dimensions including winding conductor area of a 3-phase delta-star type transformer rated at 300 KVA 6600/440 volts, 50 Hz. A suitable core with 3 steps having circumscribing circle of 0.25 m diameter and leg spacing of 0.4 m is available. Emp per turn = 0.5 volt, current density = 2.5 A/mm², kw = 0.28, stocking factor = 0.9.

Q.4 Derive the expressions for design of rotor and end rings of squirrel cage. Also mention the limitations of squirrel cage rotor.

Q.5 Write short notes on –

(A) FEM based machine design.

(B) Operating characteristics of induction motor.

5E5042

5E5042

B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical Engineering
5EE2A Microprocessors & Computer Architecture

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT- I

Q.1 (a) Explain various types of buses used in 8085 microprocessor.   [8]

(b) Draw the architecture of 8085 microprocessor and explain functions of various registers.   [8]

OR

Q.1 (a) How address lines are multiplexed? Explain in detail with the help of latching circuit diagram?   [8]

(b) Explain the control and status signals available in 8085 microprocessor.   [8]

UNIT- II

(a) Explain the following instructions using suitable examples -

    [4×2=8]

  (i)   XCHG

  (ii) DAD

  (iii) DAA

  (iv) LHLD

(b) Explain various addressing modes of 8085 using suitable examples.

    [8]

OR

(a) Explain the use of rotate instructions with the help of suitable examples.   [8]

(b) Draw the flow chart and write a program to perform addition of two 8-bit numbers.

    [8]

UNIT- III

(a) Explain the interfacing of 8257 to 8085 microprocessor.

    [8]

(b) Draw the block diagram of 8279 and explain the function of each block. Also, describe its command word format.

    [8]

OR

a) Draw block diagram of 8255 and explain its various modes of operation.   [8]

b) Draw the block diagram of programmable interval timer 8253 and explain its various blocks.

    [8]

UNIT- IV

Q.4 (a) Draw pin diagram of 8086 microprocessor & explain the features of 8086 microprocessor. [8]

(b) Write a comparison between 8085 and 8086. [8]

OR

Q.4 (a) Draw the block diagram of 8086 microprocessor Explain pipelining and segmented memory concept. [8]

(b) Explain various instruction formats applicable to the 8086 instruction set. Briefly, describe addressing modes of 8086. [8]

UNIT- V

Q.5 (a) Define memory and its various types in detail. [8]

(b) What do you understand by terms memory latency, memory seek time and memory bandwidth? [8]

OR

Q.5 Write short note on - (Any four) [4×4=16]

(a) Virtual memory

(b) Cache Memory

(c) Flash Memory

(d) Volatile memory

(e) Non-volatile memory

(f) Different types of ROM

5E1769

B. Tech. V - Sem. (Main) Exam., February - 2023
Electrical Engineering
5EE5 – 11 Restructured Power System (Elective-I)

Time: 3 Hours   Maximum Marks: 70

Instructions to Candidates:

    Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.

    Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

    Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

PART – A

(Answer should be given up to 25 words only)   **[10×2=20]**
All questions are compulsory

Q.1 Write a short note on the "Deregulation" of power industry.

Q.2 State the "Law of Diminishing Marginal Utility".

Q.3 Explain the term "Deadweight Loss".

Q.4 Give two reasons to consider electricity as a distinguished commodity from other commodities.

Q.5 What are "Bilateral Contracts" in power market?

Q.6 Explain "Available Transfer Capability" in brief.

Q.7 What is "Counter Trade Method" of Transmission Congestion Management?

Q.8 Explain in brief the Black Start Capability Service.

Q.9 Name three classifications of Ancillary Services with one example for each.

Q.10 Briefly explain the HHI index and the Lerner Index.

PART – B

Q.1 While defining the attributes of a perfectly competitive market, explain how the competition may help restructure the power market.

Q.2 Compare among Monopoly, Single Buyer, Wholesale Competition and Retail Competition market models based on their attributes and significance.

Q.3 Discuss any four market-based Transmission Congestion Management methods.

Q.4 What are the mandatory provisions of Ancillary Services for a participating power generator before it gets connected to the grid?

Q.5 Define the terms Monopoly and Oligopoly in the power industry.

Q.6 What is Nodal Pricing in Transmission Congestion Management system?

Q.7 What are the various debatable issues and basis for allocating transmission network costs to different power system entities?

PART – C

Q.1 Write a detailed note on the current scenario of the Indian power industry. Elaborate on the apparent improvements in the overall Indian power systems structure in line with power system restructuring.

Q.2 Write a detailed note on various entities involved in the process of "Deregulation" of the power industry.

Q.3 What is a power exchange? With the help of a suitable diagram, explain the mechanism of obtaining the market clearing price in the power exchange through electronic trading.

Q.4 Discuss voltage control and frequency control as provisions of Ancillary Services in any two international markets other than India.

Q.5 What are the principles to be followed in designing transmission pricing schemes? Discuss various cost components taken into account for providing transmission services.

5E1366

B. Tech. V - Sem. (Back) Exam., February - 2023
PCC/ PEC Electrical Engineering
5EE5-11 Restructured Power System

Time: 2 Hours

Maximum Marks: 80
Min. Passing Marks: 28

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL _____

2. NIL _____

PART – A

[5×2=10]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1   What do you mean by restructured power system?

Q.2   What are the objectives of deregulation of various power systems across the world?

Q.3   Define Locational Marginal Prices (LMPs).

Q.4   Mention the various provisions of ancillary services.

Q.5   What do you understand by HHI Index?

PART – B

[4×10=40]

(Analytical/Problem solving questions)
Attempt any four questions

Q.1 Derive the expressions for models of imperfect competition conditions of market. Explain the Bertrand and Cournet models in detail.

Q.2 Define and explain different services that are considered as Ancillary Services in a deregulated power system. Also, classify the services which fall under the direct control of ISO.

Q.3 What is congestion management in power system? Explain with an example, its impact on power system.

Q.4 Discuss different capacity alleviation methods with the help of suitable example and diagrams.

Q.5 Write a brief note on -
(A) Attributes of a perfectly competitive market
(B) Four pillars of market design

PART – C

[2×15=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any two questions

Q.1 Define and explain the following terms -
(A) Total Transfer Capability (TTC)
(B) Available Transfer Capability (ATC)
(C) Transmission Reliability Margin (TRM)

Q.2 Discuss in detail the importance of distributed generation in today's power scenario. What are the operating conflicts and connection to utility problems of distributed generation?

Q.3 Write a detailed note on –
(A) Monopoly and Oligopoly
(B) Co-optimization of energy and reserve services
(C) Distinguishing features of electricity as a commodity

5E5047

5E5047

B. Tech. V - Sem. (Back) Exam., February - 2023
Electrical Engineering
5EE6.2A Principle of Communication Systems
EE, EX

Time: 3 Hours   **Maximum Marks: 80**
                                                Min. Passing Marks: 24

Instructions to Candidates:

Attempt any **five questions,** *selecting* **one question** *from* **each unit.** *All questions carry* **equal** *marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL _____   2. NIL _____

UNIT- I

Q.1 (a) Derive an expression to calculate equivalent noise temperature in cascaded circuits. [8]

(b) A 600 Ω resistor is connected across the 600 Ω antenna input of a radio receiver. The bandwidth of the radio receiver is 20 kHz and the resistor is at room temperature of 27°C. Calculate the noise power and the noise voltage applied at the input of the receiver. [8]

OR

Q.1 Briefly explain the following –

(a) Resistor noise [5]

(b) Noise temperature [5]

(c) Noise Bandwidth [6]

UNIT- II

Q.2 (a) Explain the Principle of Operation of a frequency discriminator with the aid of a diagram. [8]

(b) Write short note on ring modulator. [8]

OR

Q.2 (a) Describe the function of super-heterodyne receiver with block diagram. [8]

(b) Show that any scheme that can be used to generate DSB SC can also generate Am. Is the converse true? Explain. [8]

UNIT- III

Q.3 (a) Draw the block diagram of PLL demodulator and explain its working. [8]

(b) Explain pre-emphasis and de-emphasis in FM broadcasting. [8]

OR

Q.3 (a) Draw the block diagram of FM receiver. Explain complete working of FM receiver. [10]

(b) Compare AM and FM systems. [6]

UNIT- IV

Q.4 (a) Derive an expression for SNR of FM demodulator. [8]

(b) Write short note on threshold in FM. [8]

OR

Q.4 (a) With the help of block diagram, explain the noisy model of FM receiver. [8]

(b) Derive the expression for figure of merit for the DSB-SC receiver. [8]

UNIT- V

Q.5 (a) Discuss PPM demodulation using suitable diagram. [8]

(b) State and prove sampling theorem. [8]

OR

Q.5 (a) State and explain the merits and demerits of PWM transmission. [8]

(b) Define pulse amplitude modulation. Describe its working principle and mathematical analysis. [8]