Roll No. .....

3237

B. Tech. 5th Semester (EE) Examination – December, 2022

POWER SYSTEMS-I

Paper : PCC-EE-301-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All question carry equal marks.

1. Explain the following : $2.5 \times 6 = 15$

(a) Balance and Unbalance faults.

(b) Neutral grounding.

(c) Function of C.B.

(d) PV panel.

(e) Voltage Source Converters (VSC).

(f) Advantage of DC transmission system.

UNIT – I

2. Draw the single-phase representation of balance three phase networks. 15

3. Draw & explain the single line, impendence diagram & representation of loads. 15

UNIT – II

4. Explain sequence impendence & network of synchronous machine. 15

5. What is 3ϕ unsymmetrical fault ? Explain double line to ground fault in detail. 15

UNIT – III

6. What do you mean by primary & back-up protection of power system & explain transmission line protection ? 15

7. Explain vacuum CB in detail. 15

UNIT – IV

8. Explain in detail type of DC links. 15

9. (a) Write a short note on permanent induction generator. 8

(b) Explain power electronics interphase of PV to the grid. 7

Roll No. .....

3238

B. Tech. 5th Semester (EE) Examination – December, 2022

CONTROL SYSTEM

Paper : PCC-EE-305-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. (a) Define close loop system. 1.5

(b) Define transmittance. 1.5

(c) Write the mason gain formula. 1.5

(d) What is signal flow graph ? 1.5

(e) Name the type of feedback used in closed loop system. 1.5

(f) What is nonlinear system ? 1.5

(g) What are the benefits of feedback ? 1.5

(h) Define unit step signal. 1.5

(i) What is transfer function ? 1.5

(j) What are the basic components of block diagram ? 1.5

SECTION – A

2. (a) Distinguish between open loop and closed loop system with examples. 8

(b) Differentiate between block diagram and signal flow graph. 7

3. (a) Using Routh Hurwitz critcrion determine the stability : 5

$$S^6 + S^5 + 5S^4 + 3S^3 + 2S^2 - 4S - 8 = 0$$

(b) Sketch the root locus for : 10

$$G(s) = \frac{K(s+1)}{s^2(s+3.6)}, H(S) = 1$$

SECTION – B

4. Draw the Bode plot of : 15

$$G(S) = \frac{16(1+0.5s)}{s^2(1+0.125s)(1+0.1s)}$$

(a) G. M. (b) P. M. (c) Stability of the system.

5. Sketch the polar plot for : 15

$$G(s) = \frac{20}{s(s+1)(s+2)}$$

SECTION – C

6. (a) Explain in detail the insensitivity and robustness of control system. 7

(b) Discuss the analog and digital implementation of Controller. 8

7. Write short notes on :

(a) Lead and lag compensation. 7

(b) Integral and derivative controllers. 8

SECTION – D

8. (a) Explain in detail the concept of state variables. 8

(b) Explain the Diagonalization of state matrix. 7

9. Write short notes on :

(a) Concept of controllability and observability. 7

(b) Solution of state equation. 8

Roll No. .....

3242

B. Tech. 5th Semester (EE) (Elective-I) Examination – December, 2022

ELECTRICAL DRIVES

Paper : PEC-EE-03-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions by selecting at least any *one* question from each Section. Question No. **1** is *compulsory*. $10 \times 1.5 = 15$

1. (a) What is the status of dc and ac drives.

(b) Explain speed sensing of dc motor drive.

(c) Explain single quadrant chopper operation.

(d) Calculate motor rating for short time duty.

(e) Explain duty ratio control of dc chopper.

(f) Draw speed-torque characteristics of induction motor.

(g) Draw equivalent circuit of induction motor.

(h) Explain dynamic braking of dc motor drive.

(i) Discuss about the speed drop with loading of induction motor.

(j) Drive fundamental torque equation of electric drive.

SECTION – A

2. Discuss closed-loop speed, current and torque control of dc motor. 15

3. Explain the operation of single phase fully controlled rectifier fed separately excited DC motor. 15

SECTION – B

4. What is load equalization ? Determine the moment of inertia of the flywheel. 15

5. Explain Multiquadrant operation of dc motor. 15

SECTION – C

6. Explain motoring and regenerative braking operation of chopper fed separately excited DC motors. 15

7. Draw and explain variation in speed-torque curve with applied voltage and frequency of induction motor. 15

SECTION – D

8. Explain four quadrant control and closed-loop operation of voltage source inverter fed Induction motor. 15

9. Discuss about the slip power recovery methods of induction motor. 15

Roll No. .....

3239

B. Tech. 5th Semester (EE) Examination – December, 2022

MICROPROCESSOR & MICROCONTROLLER

Paper : PCC-EE-309-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any ***five*** questions. Question No. **1** is ***compulsory***. Attempt any ***one*** question from each of four Sections.

1. Explain the following :

(a) Explain different registers used in 8086. 2

(b) Explain any *two* instruction of 8026 with example. 2

(c) What is direct addressing mode ? 2

(d) Differentiate between RISC and CISC. 3

(e) Explain Interrupts of microcontrollers. 3

(f) Differentiate between Microprocessor and Microcontroller. 3

SECTION – A

2. Explain the working of 8086 microprocessor with its block diagram. Also draw its PIN diagram. 15

3. (a) Write and explain the minimum mode and maximum mode operations of 8086 microprocessor with the help of suitable diagram. 7

(b) Explain the different addressing modes used in 8086. Explain each with example. 8

SECTION – B

4. (a) Explain the architecture and working of USART. 8

(b) Describe the working of 8279. 7

5. Describe the working of DMA controller with suitable diagram. 15

SECTION – C

6. (a) Define microcontrollers. Explain the different types of microcontrollers in detail. 8

(b) Explain Harvard architecture. 7

7. Explain the following : 15

(a) Memory types in Microcontroller

(b) Princeton Architecture

SECTION – D

8. Draw and explain the architectural features of 8051 microcontroller. 15

9. What is memory organization ? Also, explain how external addressing is done ? 15

Roll No. .....

3240

B. Tech. 5th Semester (EE) Examination – December, 2022

COMPUTER AIDED ELECTRICAL MACHINE DESIGN

Paper : PCC-EE-313-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Explain the following : $2.5 \times 6 = 15$

(a) How to joint in a transformer effects the losses.

(b) Explain short and hard magnetic materials.

(c) What is magnetic loading ?

(d) What do you understand by coil span & pole pitch ?

(e) Explain leakage flux.

(f) What do you mean by leakage reluctance ?

UNIT – I

2. Describe an output equation of AC machine and discuss various factors affecting size of rotating machine. 15

3. Describe an expression for temperature rise of electrical machine in terms of its heating time and continuous and final temperature rise. 15

UNIT – II

4. Explain the detailed design of induction motor. 15

5. Deduce an expression for a 3-phase induction motor and design the following information for a 30 KW, 440V, 3 phase, 6 pole, 50 Hz delta connected squirrel cage induction motor : 15

(i) Main dimension

(ii) No. of turns per phases in stator winding

(iii) No. of stator slots

(iv) No. of conductor per slot

Assume :

Specific magnetic loading = 0.48 tesla

Specific electric loading = 26000 ampere conductor per meter.

Full load efficiency = 88%

Full load power factor = 0.86

UNIT – III

6. Determine for a 12.5 MVA, 6.6 KV, 20 pols, 50Hz, 3 phase alternator suitable value for diameter at air gap, length of core, no. of stator slots and stator conductors. Assume appropriate value for the missing design constants. 15

7. Draw the flow chart for overall design of transformer. The design must include : 15

(i) Efficiency

(ii) Design of tank and cooling system

(iii) Cost

(iv) Main dimension & yoke dimension

Determine the main dimensions of core and yoke.

UNIT – IV

8. Enlist the advantage of CAD for machine design along with its limitations. 15

9. Write a computer program to design an armature of a DC motor. 15

Roll No. .....

3247

B. Tech. 5th Semester (EE) (Elective-II) Examination – December, 2022

POWER PLANT ENGINEERING

Paper : OEC-EE-07-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question number 1 is ***compulsory***. All questions carry equal marks.

1. Write short notes on : $2.5 \times 6 = 15$

(a) FBC Boilers

(b) Gas Turbine

(c) PHWR

(d) Biogas

(e) Pollution Control Technology

(f) Super Critical Boilers

UNIT – I

2. Explain the layout of modern coal power plant with neat sketch. 15

3. Enumerate and explain various modern ash-handling systems. 15

UNIT – II

4. What are the important considerations to be taken account while deciding about layout of a gas turbine power plant ? 15

5. Explain combined cycle power plants in details. 15

UNIT – III

6. Explain the construction and working of CANDU with neat sketch with its various advantage and disadvantage. 15

7. Discuss the safety measures for Nuclear power plants. 15

UNIT – IV

8. How solar radiation estimation is carried out ? Discuss the working of solar energy collectors. 15

9. With neat sketch explain the working of Wind and Tidal Power Plants. 15

Roll No. .....

3024

B. Tech. 5th Semester

Examination – December, 2022

ECONOMICS FOR ENGINEERS

Paper : HSMC-01-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. Write short notes in **40-50** words : $2.5 \times 6 = 15$

(i) Law of Supply

(ii) Factors of Production

(iii) Opportunity cost

(iv) Monopoly market

(v) Supply

(vi) Diseconomies of scale

UNIT – I

2. What do you mean by Economic problem ? Explain nature of economic problem and how does production possibility curve helps to solve these economic problems ? 15

3. What do you mean by Elasticity of demand ? Explain various factors effecting elasticity of demand. 15

UNIT – II

4. What do you mean by economies of scale ? Explain various economies and diseconomies of scale. 15

5. Explain the following : 15

(i) Opportunity cost

(ii) Marginal cost

(iii) Total cost

UNIT – III

6. Define Market. Explain main features of monopoly and monopolistic competition. 15

7. Explain Marginal cost, Average cost and Total costs in short run with suitable diagrams. 15

UNIT – IV

8. What do you mean by Privatization ? Explain its merits and demerits. 15

9. Write a detailed note on Globalisation of Indian economy. Also explain its merits and demerits. 15
