B.Tech. (EE) 5th Semester (G-Scheme)
Examination, December–2025

POWER SYSTEM-1
Paper– PCC-EE-301-G

Time allowed : 3 hours] *[Maximum marks : 75*

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

1. (a) Why is per unit system used in power system analysis? 2.5×6

   (b) Which is most severe type of fault in power system? Give its representation.

   (c) Define current chopping and resistance chopping.

   (d) Write different attributes of protection scheme.

   (e) Mention the applications of HVDC transmission system.

   (f) What are the causes of unsymmetrical fault in power system?

Section-A

2. (a) Three generators are rated as follows.
   Generator 1: 100 MVA, 33KV, reactance =10%
   Generator 2: 150 MVA, 32 KV, reactance = 8%
   Generator 3: 110 MVA, 30 KV, reactance= 12%

Choosing 200 MVA and 35 KV as base quantities, compute per unit reactance of three generators referred to base quantities. Draw reactance diagram also. 7.5

(b) Draw and explain single line diagram and impedance diagram of power system. 7.5

3. (a) Explain the transmission of electrical power in power system. 7.5

(b) Explain complex power flow in single-phase load and three -phase load. 7.5

Section-B

4. Explain how an unsymmetrical system of 3-phase currents can be resolved into symmetrical component systems. 15

5. Describe how the sequence network is represented for transmission lines in 3-phase system. 15

Section-C

6. Discuss the principle of operation of SF 6. Circuit breaker. What is advantage and disadvantage of using SF_6 as an arc quenching medium? 15

7. Compare between primary and back -up protection. Explain the role of back up protection. List the various methods of providing back up protection. 15

Section-D

8. Describe LCC (Line commutated converter) and VSC (Voltage source converters). 15

9. (a) Explain wind energy generation systems. 7.5

(b) Draw and explain I-V and P-V characteristics of PV panels. 7.5

B.Tech. (EE) 5th Semester (G-Scheme)
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CONTROL SYSTEM

Paper– PCC-EE-305-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note : ***First Question is compulsory.*** *Attempt five questions is all, selecting* ***one*** *question from each section.*

1. (a) Define observability and controllability

(b) What is a nontouching loop? Explain.

(c) Define phase margin.

(d) Discuss briefly about Routh's stability criterion.

(e) Discuss the relationship between transfer function & impulse response of a system.

(f) Define servomechanism and compensation.

(g) Explain the pole placement by state feedback.

(h) State properties of State transition matrix.

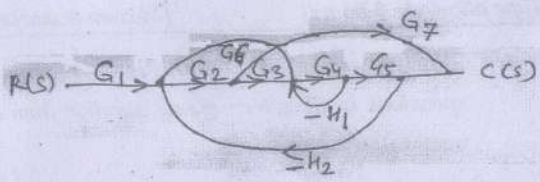
(i) Compare a closed loop and an open loop system

(j) Define steady state error in a control system.

10×1.5=15

Section-A

2. (a) Find the transfer function from the given signal flow graph applying Mason's gain formula. 7.5



(b) Explain open loop and closed loop system with examples. 7.5

3. Sketch the root locus for: 15

$$G(s) = \frac{K(s+2)}{s^2(s+3)(s+5)}$$

Section-B

4. The open loop transfer function of a unity feedback control system is given below:

$$G(s) = \frac{(s+0.25)}{s^2(s+1)(s+0.5)}$$

Find the closed loop stability by applying Nyquist criterion. 15

5. Write note on: 15

(i) Polar Plot

(ii) Relationship between time & frequency Response. 15

Section-C

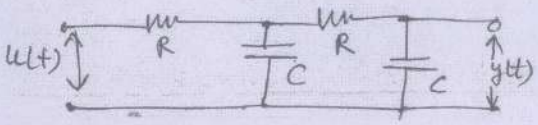
6. Explain the general procedure to plot root locus. A given transfer function of a control system is given by

$$G(s)H(s) = \frac{k}{s(s+4)(s^2+4s+13)}$$ sketch its root locus and find the breakaway points 15

7. Discuss the effect of Integral & derivative control action on system performance. 15

Section-D

8. Obtain the state model for a system represented by an electrical system as shown. 15



9. State & explain the concept of controllability & observability. Use an example to explain this. 15

B.Tech. (EE) 5th Semester (G-Scheme)
Examination, December–2025

MICROPROCESSOR AND MICROCONTROLLER
Paper– PCC-EE-309-G

Time allowed : 3 hours] *[Maximum marks : 75*

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

1. (a) Write conditions to start the timer 8253.

(b) What is a" bus cycle?

(c) List the flags and interrupts of 8086 microprocessor.

(d) List the advantages of Memory segmentation?

(e) Explain real time application of 8051.

(f) Explain DAC. 6×2.5=15

Unit-I

2. (a) Explain difference between linear addressing and segmented memory addressing. 7.5

(b) Explain the requirement of program counter stack pointer and status flags in architecture of 8086 microprocessor. 7.5

3. (a) Explain the physical memory organization in 8086 microprocessor. 7.5

(b) What is assembly language and what are its advantages? 7.5

Unit-II

4. (a) Explain A/D & D/A interface. 7.5

   (b) Describe internal architecture & working of 8237 (DMA Controller). 7.5

5. Explain the following: 7.5

   (a) USART

   (b) Timer/counter (8253)

Unit-III

6. Explain interrupts, Timers and peripherals in detail. 15

7. (a) Explain External Memory microcontrollers. 7.5

   (b) Explain Harvard *V/S* Princeton 7.5

Unit-IV

8. (a) Discuss how is the 8051-interrupt priority set. 7.5

   (b) Explain in brief the pin diagram of 8051 microcontroller. 7.5

9. (a) Describe the addressing modes in 8051 microcontroller in detail. 7.5

   (b) Explain various registers present in 8051 microcontroller and describe their functionality in detail. 7.5

B.Tech. (EE) 5th Semester (G-Scheme)
Examination, December–2025
COMPUTER AIDED ELECTRICAL MACHINE DESIGN
Paper– PCC-EE-313-G

Time allowed : 3 hours] *[Maximum marks : 75*

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

1. Explain the following: 2.5×6=15

   (a) Explain the limitation of computer aided design.

   (b) What do you mean by term optimization in electrical machine design?

   (c) What are the properties required of transformer oil?

   (d) Enlist the advantages of computer aided design.

   (e) Explain magnetic loading.

   (f) Explain direct and indirect cooling

Unit-I

2. (a) Define the following: 15

   (1) Specific electric loading.

   (2) Specific magnetic loading.

(b) Discuss the factor on which the choice of specific electric and specific magnetic loading depends. 15

3. Describe an output question of an AC machine and discuss various factor affecting size of rotating machine. 15

Unit-II

4. In the design of 30hp, 3 phase, 440V, 960rpm, 50Hz delta connected induction motor assume the specific electrical loading of 25000 ac/m specific magnetic loading of 0.4 wb/m^2. Full load efficiency 86% power factor 0.87 and estimate the following: 15

(i) Stator core dimension.

(ii) No. of stator slots and winding turns.

5. Deduce an expression for the mmf required for the air gap of an armature with slot and ducts. 15

Unit-III

6. Discuss in detail the design of the field system of non-salient pole alternator. 15

7. Design a 250KVA, 2000/400V, 50Hz single phase core type, oil immersed self-cooled power transformer with following data:- 15

Induced emf per turn =15V

Max. flux density in core =1.25 wb/m^2

Current density = 2.75 A/mm^2

Window space factor = 0.3

Window proportions = height/width = 3

Unit-IV

8. Explain optimization technique for machine design. 15

9. Explain hybrid method of CAD. 15

B.Tech. (EE) Elective-I 5th Semester (G-Scheme)
Examination, December–2025
ELECTRICAL DRIVES
Paper– PEC-EE-03-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all. **Q. 1 is compulsory.** Attempt **four** more question from the sections A, B, C & D by selecting at least one question from each section.*

1. (a) The choice of electrical drive machines depends on which factors? 5×3=15

   (b) Discuss the efficiency of DC drives in brief.

   (c) What is the physical significance of Ratings of Machines?

   (d) Explain the term "flux weakening operation" in Induction machines.

   (e) What do you mean by slip power recovery?

Section-A

2. Draw and explain the torque-speed characteristics of separately excited DC Motor. 15

3. Explain the microprocessor-based control of electric drives. 15

Section-B

4. How does regenerative braking work in a multi-quadrant DC drive? 15

5. How Heating and cooling effects the Selection of motor power rating? 15

Section-C

6. Discuss the losses in DC motor and chopper for calculating the efficiency of DC drive. 15

7. Draw and explain the typical torque-speed curves of fan and pump loads. 15

Section-D

8. What is space vector theory? Discuss conventional space vector modulation in detail. 15

9. Discuss the power electronic based rotor side control of slip ring motor. 15

B.Tech. (EE) Elective-II 5th Semester (G-Scheme) Examination, December–2025

POWER PLANT ENGINEERING

Paper– OEC-EE-07-G

Time allowed : 3 hours] *[Maximum marks : 75*

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

1. Explain following: 6×2.5=15

(a) List out the types of boilers 2.5

(b) Define FBC 2.5

(c) Generalize the processes of Brayton cycle' 2.5

(d) Define a 'CANDU' reactor 2.5

(e) Define the term "Breeding" 2.5

(f) List the components of Tidal power plants 2.5

Section -A

2. Write shorts notes on : 7.5

(i) Ash handling system.

(ii) Different draught systems. 7.5

3. Demonstrate the power plant performance and its efficiency and explain about pulverized coal system. 15

Section-B

4. Explain the working of open cycle and closed cycle Gas turbine power plant and discuss its advantages and disadvantages. 15

5. Explain the layout of an Integrated Gasifier based Combined Cycle Power Plant. 15

Section-C

6. (i) List and brief the characteristics features of a BWR. 7.5

   (ii) Describe the India's three stage nuclear power programme 7.5

7. (i) Explain the functions of reflectors and cladding. 7.5

   (ii) Explain the necessity of pressurizer in a PWR power plant 7.5

Section-D

8. Describe in detail about surge tank used in hydro electric power plant. Also explain about the classification and selection of dams. 15

9. Explain the pollution control technologies including waste disposal options for coal power plant. 15