Enrollment No……

Bachelor of Engineering
Seventh Semester Main Examination, Dec-2020
Electrical Drives [EX-701]
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) What are electrical drives? Explain its main components.
b) Explain the operation of 1-Ø fully controlled converter fed separately excited DC motor.

Q.1 a) Explain electric drives with its components and block diagram?
b)Explain the operation of single phase fully controlled converter fed separately excited DC motor Drive?

Q.2 a) A 220V, 1500 rpm, 1OA separately excited dc motor with an armature resistance of 3Ω is fed from a single phase fully controlled rectifier connected to an ac source voltage of230 V, 50 Hz. Assuming conduction, calculate the firing angle for half the motor torque at 600 rpm.
b) Explain the speed -torque characteristics of DC motor?

Q.3 a) Explain the following Braking methods of DC motor
i) Plugging Braking ii) Dynamic Braking iii) Regenerative Braking
b) Discuss the operation of four Quadrant Chopper?

Q.4 a) Explain the two modes in which a dual converter is used to control the dc motor speed. Which of the two methods is better and why?
b) Compare the operations of VSI and CSI?

Q.5 a) What are the Speed-Torque Characteristics of Induction Motor?
b) Write a short Note on:
1. Static Kramer Drive
2. Slip power recovery

Q.6 a) What is Static rotor resistance control?
b) Write the applications and advantages of synchronous motor drive?

Q.7 a) Discuss rotor resistance control scheme of Induction motor drive?

b) Discuss in brief the circuit diagram for load commutated CSI fed synchronous motor?

Q.8 a) Explain variable frequency control of frequency motor?
b) Explain the operation of cycloconverter fed self controlled synchronous motor drive.

Enrollment No……

Bachelor of Engineering
Seventh Semester Main Examination, Dec-2020
HVDC Transmission [EX-702]
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) What are the Modern trends in D.C. Transmission? Discuss in brief.
(b) Discuss the Application of DC Transmission System.

Q.2 (a) What are the characterstics of characteristics of 6 Pulse & 12 Pulse converters?
(b) What are the Cases of two 3 phase converters in star–star mode?

Q.3 (a) What are the operations of Graetz circuit and derive expression for output voltages?
(b) What are the Effect of source inductance on the system? Explain in detail.

Q4 (a) Explain various kinds of DC link?
(b) Explain typical HVDC converter station with schematic diagram?

Q.5 (a)What are the protection against over current and over voltage in converter station?
(b)Explain in detail: surge arresters, smoothing reactors. Corona effects on DC lines.

Q.6 (a)What are the causes of harmonics in HVDC system? Explain the adverse effects in HVDC system.
(b) Explain in detail-Design of Single tuned filters, Design of High pass filters?

Q.7 (a) What is the effect of Pulse number on harmonics? Explain in detail?
(b)Explain: -Simultaneous method and Sequential method.

Q.8 Write a short note on (any 3)
Comparison of AC &DC Transmission
Types of HVDC Links
Firing angle control
Current and extinction angle control

Enrollment No……

Bachelor of Engineering
Seventh Semester Main Examination, Dec-2020
Electrical Machines – III [EX-703]
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 integral slots and fractional slot winding.
(b) What do you understand by winding factor? Explain in detail?

Q.2 (a) Derive the EM.F. equation of synchronous machine?
(b) A50 Hz,3-Ø, star connected alternator which generates 10000V between lines on open circuit, has a flux per pole of 15×10^{-2} wb. If the distribution factor of the full pitch coil is .96.Find the number of armature conductor in series per phase?

Q.3 (a) Explain in details the methods for suppression of harmonics in synchronous generators?
(b)What is armature reaction? Explain the effect of armature reaction in synchronous generator? (with necessary diagram).

Q.4 (a) Draw the phasor diagrams for inductive, resistive and capacitive loads. With suitable emf equations.
(b) Determine the regulation of a 2kv single phase alternator, delivering a current of100A at 0.8 pf leading.
Test result: full load current of 100 A is produced on short circuit by a field excitation of 2.5A. An emf of 500V is produced on open circuit by the same field current. The armature resistance is 0.8Ω.

Q.5 (a) Determine voltage regulation by (any one)
i) M.M.F method
ii) Potier's triangle Method
(b) What is the use of synchronous Impedance method. Explain?

Q.6 (a) A 3-phase, Star connected,1000kva,11000V alternator has rated current of 52.5A. The ac resistance of the winding per phase is 0.45Ω
OC test: field current=12.5A, voltage between lines =422V
SC test: field current=12.5A, line current =52.5A
Determine the full load voltage regulation of the generator at 0.8pf lagging.
(b) Explain two reactance theory for salient poles synchronous machines?

Q.7 (a) A 5kva, 220V, star connected 3-phase salient pole alternator with direct and quadrature axis reactance of 12Ω and 7Ω respectively, delivers full load current at unity power factor. Calculate the excitation voltage, neglecting resistance.
(b) Determine sub-transient, transient and steady state reactance?

Q.8 (a) What is the need for parallel operation of synchronous generator?
(b) Explain the principle of operation for synchronous motor?

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Bachelor of Engineering
Seventh Semester Main Examination, Dec-2020
Power Quality [EX-7103]
Branch-EX

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

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

Q.1 (a) Define power quality. Explain the reason for increased concern in power quality.

(b) Write short note on-general classes of power quality problem.

Q.2 (a) What are the various methods of estimating sag performance?
(b) What are the different types of transient over voltage?

Q.3 (a) What are the basic principles of over voltage protection of load equipment?
(b) What are the different ways of estimating voltages sag performance?

Q.4 (a) Explain the fundamentals of harmonics and harmonics distortion?
(b) Explain in brief harmonics sources from commercial load and from industrial loads.

Q.5 (a) Describe harmonic distortion? Explain the principles for controlling harmonics?
(b) Write short note on: filters, passive input filter?

Q.6 (a) Explain Constant frequency control and constant tolerance band control.
(b) Explain variable tolerance band control and discontinuous current control.

Q.7 (a) What is the need for overvoltage protection?
(b) What are the devices for controlling harmonic distortion? Explain the operation of any one of them?

Q.8 Write short note on:-
(i) Monitoring sags
(ii) Voltage sags
(iii) Interruption

Enrollment No……

Bachelor of Engineering
Seventh Semester Main Examination, Dec-2020
SCADA Systems & Application [EX-7202]
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) Explain Data acquisition system in SCADA?
(b) Draw a neat sketch of: Ladder diagram of PLC.

Q.2 (a) What are the components of SCADA system? Explain in detail.
(b) Write a short note on Energy management system.

Q.3 (a) What is HMI System of SCADA Architecture?
(b) What are the advantages of interconnected power system?

Q.4 (a) Explain open standard communication protocols in SCADA.
(b) Write short note on: (a) Remote Terminal Unit (b) Intelligent Electronic Devices

Q.5 (a) Differentiate between wired and wireless methods of SCADA Communication?
(b) Write short note on: (a) Communication Network (b) SCADA server

Q.6 (a) What are monitoring and supervisory functions of Data acquisition system in SCADA?
(b) How do SCADA communicate?

Q.7 (a) Describe IEC 61850 SCADA in brief.
(b) What is the programming language of PLC?

Q.8 (a) How can we interface PLC with SCADA? Explain with the help of necessary diagrams.
(b) What do you understand by SCADA configuration?