

F 6443

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL MACHINES—III (E)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. Explain the power stages in three-phase induction motor.
2. Discuss cogging and the methods for eliminating it.
3. Explain the design of rotor rheostat starter.
4. Discuss the advantages and applications of three-phase induction motors.
5. Explain the working principle of induction generator.
6. Discuss the applications of induction generator.
7. What is the necessity of centrifugal switch in single-phase induction motor ?
8. Differentiate between Conductively compensated and Inductively compensated series motor.
9. Discuss how commutator machines can be used as frequency converters.
10. List the applications of linear induction motor.

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. The following data refer to a 10 pole, 400 V, 50 Hz, 3-phase induction motor. $R_1 = 1.75 \Omega$, $X_1 = 5.5 \Omega$, $R_2' = 2.25 \Omega$ (rotor resistance referred to stator) = 2.25 Ω , $X_2' = 6.6 \Omega$ (rotor standstill reactance referred to stator) = 6.6 Ω . When the motor is tested at no load, it takes a line current of 3.8 A and the total core loss is 310 W. By using approximate equivalent circuit at 4 % slip, calculate :
(a) Rotor current ; (b) Input current and power factor ; (c) Mechanical power developed ; and
(d) Gross load torque.

Or

Turn over

12. A 3.73 kW, 200 V, 4 pole, 50 Hz, 3-phase, star-connected induction motor gave the following test result :

<i>Test</i>	<i>Line voltage</i>	<i>Line Current</i>	<i>Total input</i>
No load ...	200 V	5 A	350 W
Blocked rotor ...	100 V	26 A	1700 W

Draw the circle diagram and estimate (a) line current, power factor and efficiency at full load ; (b) Maximum torque in terms of full-load torque. The rotor copper loss at standstill is half the total copper loss.

13. Explain the various methods of speed control of squirrel-cage induction motor.

Or

14. A 400 V, 50 Hz induction motor when started directly from the mains takes 4 times the full-load current and torque produced is twice the full-load torque. Determine :

- Line current and starting torque when started by an autotransformer of ratio 2.5 : 1.
- The voltage to be applied and the motor current if full-load torque is to be obtained at starting.

15. Explain the working principle of single phase induction motor using double revolving field theory.

Or

16. Draw the equivalent circuit of the single-phase induction motor and explain the parameters.

17. Explain the construction and working of shaded pole motor with neat diagrams.

Or

18. Explain the construction and working of :

- Universal motor.
- Reluctance motor.

19. Explain the principle of commutator motors. Discuss different types of commutator motors.

Or

20. Write short notes on the following :—

- Double cage induction motor.
- Types of phase advancers.

(5 × 12 = 60 marks)

F 6453

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL DRIVES AND CONTROL (E)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. Give block diagram of a typical electric drive.
2. Enumerate the basic feature of an electric drive.
3. Draw and explain briefly the torque-speed characteristic of a full converter feeding a separately excited dc motor.
4. What is four quadrant DC drive ?
5. Explain the advantages of variable frequency induction motor drive.
6. Draw and explain the torque slip profile of an induction motor for different voltages.
7. Compare VSI and CSI fed induction motor drive.
8. Briefly explain the PWM principle for the voltage controlled fed induction motor drive.
9. How synchronous motor drive works ?
10. What is self control mode of synchronous motor ?

(10 × 4 = 40 marks)

Part B

Each question carries 12 marks.

11. With neat waveforms explain the operation of a single-phase fully controlled bridge rectifier dc drive. Derive the performance parameter.

Or

12. Discuss the different methods of speed control of DC motor.
13. With a neat sketch, explain the operation of Chopper fed DC motor drive.

Or

Turn over

14. Draw the power circuit diagram of a three-phase converter feeding a DC motor. Explain the various modes of operation and speed-torque characteristics.
15. With necessary block diagram explain the V/f control scheme.

Or

16. With a neat sketch, explain the operation of static Scherbius drive.
17. Explain the operation of current source inverter fed induction motor drive.

Or

18. With necessary block diagram, explain PWM inverter drive. Discuss the merits.
19. With necessary derivation obtain the steady-state torque-load angle characteristics of salient pole synchronous machine.

Or

20. Explain the operation of voltage source inverter synchronous motor drive with open-loop control.

(5 × 12 = 60 marks)

F 6507

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Electrical and Electronics Engineering

HVDC ENGINEERING (Elective I) (E)

(Old Scheme—Supplementary/ Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 4 marks.

1. Discuss about the applications of DC transmission.
2. If the DC current varies with time, prove that $\frac{I_{d1} + I_{d2}}{2} = I_S [\cos \alpha - \cos(\alpha + u)]$ where I_{d1} is the DC current at the beginning of the commutation ($wt = \alpha$) and I_{d2} is the DC current at the end of commutation ($wt = \alpha + u$). Assume the two and three valves conduction mode.
3. What are the drawbacks of IPC scheme ?
4. Discuss about the hierarchial control structure for a DC link.
5. Discuss about the effects of a single commutation failure.
6. What are the basic types of faults that occur in coverters ?
7. What is meant by non-characteristics Haemonics ?
8. Discuss about the sources of haemonics in HVDC system.
9. Discuss about the control system used for TCR.
10. Discuss about parallel connected mesh type MTDC system.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 marks.

11. (a) Discuss about the factors which limits the applications of DC transmission. (5 marks)
- (b) Write short notes on reliability, energy availability, transient reliability. (7 marks)

Or

- 12 Analyse a graetz bridge neglecting overlap. (12 marks)

Turn over

13. A monopolar HVDC link has one bridge at each terminal. The parameters of the link are

$\alpha_{\min} = 5^\circ$, $r_{\min} = 18^\circ$, $R_d = 5$ ohms, $R_{cr} = 10$ ohms, $R_{Ci} = 12$ ohms, $V_{dor} = 115$ kV, I_{ref} at the rectifier = 1kA

I_{ref} at the inverter = 900 A. (i) if $V_{doi} = 117.5$ kV calculate I_d , α , P_i , Q_i , γ ; (ii) Repeat the problem if $V_{doi} = 120$ kV.

(12 marks)

Or

14. Explain in detail about the different variations of EPC schemes. (12 marks)
15. Compute the maximum voltage dip at the converter bus that will not result in a commutation failure. Assume that the voltage dip occurs at the instant immediately after firing the incoming valve. Consider the symmetrical three phase voltage dip.

(12 marks)

Or

16. (a) Discuss about the protection against overcurrents. (6 marks)
- (b) Discuss about the overvoltage protection in a converter station. (6 marks)
17. (a) Discuss about the location of smoothing reactor and different criterion for the sizing of reactor. (8 marks)
- (b) Discuss about corona loss. (4 marks)

Or

18. Discuss in detail about the AC filters. (12 marks)
19. Discuss about the static VAR systems. (12 marks)

Or

20. (a) Discuss about the series MTDC system. (8 marks)
- (b) Discuss about the applications of MTDC system. (4 marks)

[5 × 12 = 60 marks]

F 6509

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch—Electrical and Electronics Engineering

OBJECT ORIENTED PROGRAMMING (Elective I) (E)

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. Elaborate the advantages of OOPs over procedure oriented programming.
2. Explain the structure of class, with proper example.
3. Distinguish 'call by value' and 'call by reference'.
4. What is meant by constructor overloading ?
5. Explain, what is meant by polymorphism, with proper examples.
6. Explain the concept of function overloading.
7. What are the different forms of inheritance ?
8. What is meant by file pointers ? Give proper examples.
9. Explain the need for pointers in programming.
10. What is meant by Runtime polymorphism ?

(10 × 4 = 40 marks)

Part B

Each full question carries 12 marks.

11. Differentiate public and private member functions with proper examples. Explain the context on which they are used.

Or

12. Explain the terms 'object', data encapsulation and data abstraction with proper examples.
13. What is meant by array of object ? On what context is it useful for programming.

Or

14. With a proper example in C++, demonstrate the use of constructors and destructors.

Turn over

15. Explain, with example, the use and implementation of friend class.

Or

16. Explain operator overloading with example.

17. Explain the file handling implemented in C++.

Or

18. Explain the characteristics of derived class.

19. Explain the term virtual function. How is it useful in programming?

Or

20. Explain, how pointers can be used to a derived object, with proper example.

(5 × 12 = 60-marks)

F 6510

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2013

Seventh Semester

Branch : Electrical and Electronics Engineering

BIOMEDICAL INSTRUMENTATION (Elective - I) [E]

(Old Scheme—Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

Part A

Each question carries 4 marks.

1. Explain the propagation of action potential in the cells.
2. Explain the Einthoven triangle.
3. Which are the different methods of blood pressure measurement ?
4. What is meant by defibrillators ?
5. Explain the terms tidal volume, residual volume, vital capacity in breathing mechanism.
6. What are inhalators ?
7. Briefly explain somatic nervous system.
8. Explain the characteristics of sleep.
9. Explain the principle of ultrasonic imaging system.
10. What is meant by computer tomography ?

(10 × 4 = 40 marks)

Part B

Each full question carries 12 marks.

11. Analyze the typical waveform obtained from ECG and its relationship to function of the cardiovascular system.

Or

12. Explain the different lead configurations used in an electrocardiogram.
13. Describe any *one* method for the measurement of GSR and ESR.

Or

14. Explain the different types of pacemakers based on pacing modes.

Turn over

15. What is meant by respirators and its different modes of operation.

Or

16. Explain the operation of spirometer.

17. Brief the anatomy of Nervous system.

Or

18. What is haemodialysis and explain any one type of haemodialyser ?

19. Explain the principle of operation of X-Ray machine and what are the uses of X-Rays in medicine and biology.

Or

20. Explain the different types of dialyzers.

(5 × 12 = 60 marks)

5/7