

**F 3543**

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Reg. No. 2111.....

Name.....

**B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**

**Eighth Semester**

Branch : Electrical and Electronics Engineering

**ELECTRICAL SYSTEM DESIGN (E)**

(Old Scheme—Prior to 2010 Admissions—Supplementary/Mercy Chance)

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 4 marks.*

1. Write a note on Carter's coefficient.
2. What is armature reaction ?
3. Give the output equation of a single-phase transformer.
4. Explain the methods of heating transformers.
5. Compare water wheel and turbo alternators.
6. What are the types of winding ?
7. Draw the electrical layout 4 storey building.
8. What are the precautions to be taken during wiring of multi storey building ?
9. Discuss the factors while selecting HT and LT cables.
10. Draw plate earthing design.

(10 × 4 = 40 marks)

**Part B**

*Each question carries 12 marks.*

11. (a) Explain the design of ventilating ducts and commutators.

*Or*

(b) Write notes on : (i) field winding design ; (ii) slot insulation ; (iii) flux density.

12. (a) Explain the design of a distribution and division transformers.

*Or*

(b) Design the core yoke and windings of a single-phase 50 Hz 100 KVA, 3300/400 V shell type transformer.

**Turn over**

13. (a) Explain the design of a stator, rotor and damper winding.

Or

(b) Discuss the design of three-phase induction motor.

14. (a) Estimate the quantity of materials required and draw the electrical wiring layout of a residential building. (make valid assumptions).

Or

(b) Estimate the quantity of materials required and draw the electrical wiring layout of a cinema hall. (Make valid assumptions).

15. (a) Design, draw layout and estimate power supply management for an underground power supply.

Or

(b) Estimate and draw the layout of indoor outdoor 11 KV transformer station with all accessories.

(5 × 12 = 60 marks)

F 3306

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**

**Eighth Semester**

Branch : Electrical and Electronics Engineering

EE 010 805 G06 – DISTRIBUTED POWER SYSTEMS – Elective IV (EE)

(New Scheme – 2010 Admissions)

[Supplementary]

Time : Three Hours

Maximum : 100 Marks

**Part A**

Answer all questions.

Each question carries 3 marks.

1. Explain characteristics of sunlight.
2. Explain Aerodynamics.
3. Write note on fuel savings.
4. Explain microhydel electric systems.
5. What is geothermal energy?

(5 × 3 = 15 marks)

**Part B**

Answer all questions.

Each question carries 5 marks.

6. Explain types of fuel cells.
7. Differentiate between drag force and lift force based on aerodynamic theory.
8. Explain integrated wind-solar system.
9. Classify bio-fuels.
10. Explain power quality issues.

(5 × 5 = 25 marks)

**Part C**

Answer all questions.

Each question carries 12 marks.

11. Explain the photovoltaic cells.

Or

12. Explain with a diagram Solar Plant.

Turn over

13. Explain the controlling and monitoring of wind farms.

Or

14. Explain wind driven induction diagrams with diagrams.

15. Explain the principle and application of wind electric system. State the basic Components and their working in wind electric system.

Or

16. Explain self excited induction generators.

17. (i) Explain geothermal energy conversions.

(ii) Explain anaerobic digestion system.

Or

18. Explain OTEC and tidal systems.

19. Briefly explain distributed generators in low voltage networks.

Or

20. Explain integrating techniques for distributed generators on networks.

(5 × 12 = 60 marks)

**F 3269**

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**

**Eighth Semester**

Branch : Electrical and Electronics Engineering

EE 010 804 L0 – OPTOELECTRONICS (Elective III) [EE]

(New Scheme – 2010 Admissions – Supplementary)

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 3 marks.*

1. Differentiate step index and graded index fibers.
2. What is meant by injection efficiency?
3. Briefly explain Optical couplers.
4. What is amplifier design of receiver section in OFC?
5. What is bragg gratings for strain and temperature sensors?

(5 × 3 = 15 marks)

**Part B**

*Answer all questions.*

*Each question carries 5 marks.*

6. What is group velocity and phase velocity?
7. What is the need of an optical source?
8. Write short notes on Phototransistors.
9. What is meant by ISI?
10. What is the principle of operation of optical amplifiers?

(5 × 5 = 25 marks)

**Part C**

*Answer all questions.*

*Each question carries 12 marks.*

11. Explain attenuation mechanism in detail with necessary diagrams.

*Or*

**Turn over**

12. (a) With necessary diagrams, explain dispersion mechanism in detail.  
(b) What are the different modes of propagation in OFC?

(6 + 6 = 12 marks)

13. Explain the principle of operation of LED and LED structures.

*Or*

14. (a) Explain in detail about LASER diodes and its characteristics.  
(b) Describe LASER structures.

15. Explain link power budget and rise time budget analysis.

*Or*

16. Write short notes on :

- (a) Phototransistors.  
(b) Cutoff wavelength and Responsivity.  
(c) A valanche Photodiodes.

17. Write short notes on :

- (a) Equalization.  
(b) Eye Diagram.

*Or*

18. (a) With neat diagram explain the fiber optic receivers and data patterns.  
(b) What are Spackle noise and Reflection noise?

19. Explain the following :

- (a) EDFA.  
(b) RAMAN Amplifiers.  
(c) Brillouin Amplifiers.

*Or*

20. Write short notes on :

- (a) Optical logic gates.  
(b) Optical computing concepts.  
(c) WDM.

[5 × 12 = 60 marks]

**F 3241**

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**

**Eighth Semester**

Branch : Electrical and Electronics Engineering

EE 01Q 803 : ELECTRICAL SYSTEM DESIGN (EE)

(New Scheme—2010 Admission—Supplementary)

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions briefly.  
Each question carries 3 marks.*

1. Discuss about Carter's coefficient.
2. In transformer, why the low voltage winding is placed near to the core ?
3. Explain the factors that govern the choice of average gap density for synchronous machine.
4. Differentiate between neutral wire and earth wire.
5. Draw a sketch of plate earthing.

(5 × 3 = 15 marks)

**Part B**

*Answer all questions.  
Each question carries 5 marks.*

6. List out the advantage and disadvantages of higher number of poles.
7. Derive the output equation of a single phase transformer.
8. State the factors that must be considered in choosing air-gap length in the case of a synchronous generator.
9. Explain the role of NEC in the design of electrical installation.
10. Discuss the general requirement of earthing.

(5 × 5 = 25 marks)

**Part C**

*Answer all questions.  
Each full question carries 12 marks.*

11. A 4 pole, 25 HP, 500 V, 600 r.p.m. series crane motor has an efficiency of 82 %. The pole face are square and the ratio of pole arc to pole pitch is 0.67. Assuming an average gap density of .55 Wb/m<sup>2</sup>, and ampere conductors per metre as 17,000, obtain the main dimension of the core and particulars of a suitable armature winding.

(12 marks)

Or

Turn over

12. (a) Explain the various factors that effected by the selection of number of poles in a DC machines. (8 marks)
- (b) Derive the output equation of a DC machine. (4 marks)
13. Determine the main dimension of the core of a 5 KVA, 11,000 / 400 V, and 50 Hz single phase core type distribution transformer having the following data : net conductor area in the window is 0.6 times the net cross-sectional area of iron in the core. The core is of square cross section. Maximum flux density is 1 tesla. Current density is 1.4 A/mm<sup>2</sup>. Window space factor is .0.2. Height of the window is 3 times its width. (12 marks)

Or

14. Describe the design of a 230V/6–0–6 V Transformer. (12 marks)
15. Determine the diameter of stator bore and core length of a 70 hp, 415 V, 3-phase, 50 Hz star connected, 6 pole induction motor for which the specific electric and magnetic loading are 32000 A/m and 0.51Wb/m<sup>2</sup> respectively. Take the efficiency as 90 % and power factor as 0.91. Assume pole pitch equal to core length. (12 marks)

Or

16. Determine for a 500 KVA, 6600 V, 12 pole, 500 r.p.m., 3 phase alternator, suitable values for (i) The diameter at air gap (ii) the core length. (iii) The number of stator conductors, (iv) the number of stator slots. Assume a star connected stator winding, a specific magnetic loading 0.6 Wb/m<sup>2</sup>, and a specific electric loading of 30,000 A/m. Assume ratio length : pole pitch = 1.5. Sketch the shape of slot and the arrangement of conductors, and specify the insulation. (12 marks)
17. A room 18 m. × 6 m. × 5 m. is to be wired in PVC wiring from a single phase 230 V supply. There are two rows of lamps along the length of the room. The number of lamps may be suitably assumed. Each lamp is controlled by an independent switch. The wiring along the wall is 4 m. above the ground and the switches are 1.3 m. above the ground. Draw the installation plan and determine the quantity of materials required and cost for the material. (12 marks)

Or

18. Explain the design and layout of a cinema theatre. (12 marks)
19. (a) Explain the pole mounted substation. (6 marks)
- (b) Draw the line diagram of the power system showing substations. (6 marks)

Or

20. A 500 KVA, 11 KV/415 V indoor substation has to be installed in a densely populated area. Make a list of materials required. (12 marks)

[5 × 12 = 60 marks]



F 3231

EE

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Reg. No.....

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**B.TECH. DEGREE EXAMINATION, NOVEMBER 2014**

**Eighth Semester**

Branch : Electrical and Electronics Engineering

EE 010 802—SWITCH GEAR AND PROTECTION (EE)

(New Scheme—2010 Admission—Supplementary)

Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 4 marks.*

1. Explain how arc is initiated and sustained in a circuit breakers when the circuit breaker contacts break.
2. Distinguish clearly between recovery voltage and re-striking voltage.
3. What is differential relay and list the applications of differential relay ?
4. Differentiate between directional over current and directional power relays.
5. What are the types of static relays ? Also give the advantages of static relay.
6. Write note on microprocessor based reactance relay.
7. Give the limitations of Bucholz relay.
8. What is carrier protection ? For what range is it used for the protection of transmission lines ?
9. What is a surge arrester ?
10. What is meant by insulation co-ordination ? What is basic insulation level ?

(10 × 4 = 40 marks)

**Part B**

*Answer all questions.*

*Each question carries 12 marks.*

11. Describe the construction, principle of operation and applications of vacuum circuit breaker with neat sketch.
- Or*
12. Explain with a neat sketch construction and working of bulk oil circuit breaker. Also give its merits and demerits.

**Turn over**

13. What are the various type of over current relays ? Discuss their area of application.

*Or*

14. Draw and explain the schematic of an impedance relay and its operating characteristics on R-X diagram.

15. Draw the block diagram of microprocessor based earth fault relay and explain the working of it in brief.

*Or*

16. Draw the block diagram of a static distance relay and explain its working.

17. Draw and explain the protection scheme of 3 phase induction motor.

*Or*

18. What type of protective device is used for the protection of an alternator against overheating of its (i) stator (ii) rotor. Discuss them in brief.

19. What are the causes of over voltages on a power system ? Why it is necessary to protect the lines and other equipments on the power system against over voltages ?

*Or*

20. What is the necessity of protecting electrical equipment against travelling waves ? Describe in brief the protective devices used for protection of equipments against travelling waves.

(5 × 12 = 60 marks)