G 5186 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

SWITCHGEAR AND PROTECTION (E)

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Explain the terms recovery voltage and restriking voltage.
2. Compare vacuum and SF_6 circuit breakers.
3. Explain the principle of working of static distance relay.
4. Give the constructional features and characteristics of directional over current relay.
5. Describe a scheme for protection of alternator against the failure of excitation.
6. Explain the principle of differential system of protection of power transformer.
7. Explain the protection of parallel feeder.
8. What is carrier current protection? What are its merits and demerits?
9. What is horn-gap arrester? Explain its working.
10. Deduce an expression for surge impedance.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. Discuss the process of arc extinction in oil circuit breaker. Draw a neat sketch of an oil circuit breaker and explain its working.

(12 marks)

Or

12. With the help of a diagram explain the working of a air blast circuit breaker. Explain the current chopping phenomenon associated with it.

(12 marks)

Turn over

13. (a) Explain the operation of an induction type directional overcurrent relay. (6 marks)

(b) Describe the working of a static over current relay. (6 marks)

Or

14. Draw and explain the block diagram of a static relay. What are the advantages and disadvantages of static relays over electromagnetic relays? (12 marks)

15. Explain over current and earth fault protection of alternators. (12 marks)

Or

16. Describe, with a neat sketch, the operation of Buchholz relay. (12 marks)

17. Explain differential pilot protection for feeders. (12 marks)

Or

18. Explain definite and time distance protection for transmission lines. (12 marks)

19. State the various causes of over voltages in a power system. Discuss about any two devices used for protection against over voltage due to lightning. (12 marks)

Or

20. Discuss about the wave propagation on OH and UG cables. (12 marks)

[5 × 12 = 60 marks]

G 5198 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

INSTRUMENTATION (E)

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*
Part A : Each question carries 4 *marks.*
Part B : Each question carries 12 *marks.*

Part A

1. What are the classifications of transducers? Explain with examples.
2. Draw the circuit of an isolation amplifier and explain.
3. Describe the principle of operation and uses of a strain gauge.
4. Explain load cells with application.
5. Explain thermoelectric effects with the laws of thermocouple.
6. Explain the principle of operation of radiation pyrometers.
7. Explain the working principle of transit type flow meter.
8. Compare and contrast null and servo type accelerometers.
9. Explain the principle of operation of an ionization gauge.
10. What are the applications of McLeod Gauge? Compare with Pirani gauge.

(10 × 4 = 40 marks)

Part B

11. (a) Define dynamic error, fidelity, bandwidth, speed of response and time constant of a system.

(5 marks)

(b) Derive the expression for the unit step response of a first order system and draw the response curve.

(7 marks)

Or

12. Draw the generalised input/output configuration of measurement systems and explain each one detail with examples.

(12 marks)

Turn over

13. Explain LVDT with its working principle, construction and applications. Also draw the LVDT circuitry for the measurement of displacement. (12 marks)

Or

14. (a) Describe with diagram different types of resistive potentiometers with uses. (6 marks)

(b) Explain the temperature effect and its compensation in strain gauges. (6 marks)

15. Describe with diagram the basic principle of operation of a thermistor, materials for construction, applications and characteristics. (12 marks)

Or

16. Describe with diagram the principle of operation, construction and bridge circuits of Resistance Temperature Detector. (12 marks)

17. Describe with diagrams the strain gauge and piezoelectric accelerometers with applications. (12 marks)

Or

18. Describe how flow is measured using ultrasonic and doppler flow meters. Compare them. (12 marks)

19. (a) Draw the block diagram of a wave analyzer and explain. What are the applications? (6 marks)

(b) Explain how angular measurement is made using special encoders. (6 marks)

Or

20. (a) Explain hair hygrometer with uses. (4 marks)

(b) Explain with figure the McLeod gauge. What are its limitations? (8 marks)

[5 × 12 = 60 marks]

G 5230 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

ADVANCED MICROPROCESSORS (E)—Elective II

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 4 *marks.*

1. What are the various registers in 8086 architecture ?
2. What are the two operating modes of 8086 ? Explain.
3. Explain what is memory banking associated with 8086 processor.
4. What are the various string instructions in 8086 ?
5. What are the salient features of 8087 math processor ?
6. What are the advanced features that 80286 has compared to 80186 ?
7. Explain the need and function of memory management unit.
8. Discuss briefly on paging mechanism.
9. What are the special pentium registers ?
10. Compare CISC and RISC achitecture.

(10 × 4 = 40 marks)

Part B

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

11. Discuss with neat block diagram the architecture of 8086 processor bringing out its pipelining feature.

Or

12. Explain with neat diagram how bus buffering and address latching are done in 8086 based system.

13. Write assembly language program for the following :—
    (i) To add 100, 8 bit numbers stored in memory and to display the result in an output port.
    (ii) To multiply 10, 8 bit numbers and to store the result in memory.

Or

14. What are the various addressing modes in 8086 ? Explain with example.

Turn over

15. Describe the internal block diagram of 8087 math coprocessor. What are the various types of data 8087 can handle ?

Or

16. Describe the various signals and their functions associated with 80286 processor.

17. Explain the protected mode of operation of 80386 processor ? How it can be switched to the protected mode ?

Or

18. Discuss the Internal Architecture of 80486 process with neat block diagram.

19. Describe the superscalar architecture of Pentium processors.

Or

20. Discuss briefly the following with reference to Pentium IV processor :

    (i) Memory interface.

    (ii) Hyper pipelined technology.

(5 × 12 = 60 marks)

G 5232 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

ADVANCED POWER ELECTRONIC SYSTEMS — (Elective II) (E)

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. What is a four quadrant converter? What are the performance parameters of a converter?
2. What are the advantages and disadvantages of a buck-boost regulator?
3. What are the normal specifications of power supplies? Name three types of d.c. power supplies.
4. What are the commonly used control methods for power supplies? Explain briefly.
5. What are the advantages of resonant converters over PWM converters?
6. Discuss briefly the principle of Zero Current Switching (ZCS).
7. Explain the need for PWM techniques in invertors. What are the various PWM techniques?
8. Discuss the principle of fixed frequency control of PWM inverter.
9. Explain briefly what is meant by displacement factor and distortion factor.
10. Draw the block schematic of electronic ballast.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. (a) Give a brief comparison of the performance of buck, boost and buck-burst regulators.

    (b) A d.c. regulator is operated at duty cycle K = 0.4. The load resistance R = 150 Ω, inductor resistance r_L = 1 Ω, resistance of filter capacitor r_C = 0.2 Ω. Determine the voltage gain for (i) buck converter, (ii) boost converter, (iii) buck-boost converter.

Or

12. Explain with neat circuit diagram and waveforms the working of a cuk regulator. Obtain the expression for its output voltage.

Turn over

13. With necessary waveforms, explain the operation of a flyback converter. Discuss the continuous and discontinuous mode of operation. What are its performance parameters?

Or

14. With power circuit diagram and waveforms explain a half bridge converter. Describe its four modes of operation.

15. Draw and explain the circuit diagram and waveforms of a half bridge series resonant converter with bidirectional switches.

Or

16. With the help of neat circuit diagram and associated waveforms, explain the operation of ZVS resonant converters in half-wave mode.

17. Describe the principle of sinusoidal PWM and its application to single phase bridges. What are its disadvantages?

Or

18. Describe with neat block diagram various current mode control schemes for PWM inverters.

19. Explain the principle of input line current shaping using boost rectifiers. Explain how the improvement in power factor is achieved.

Or

20. Describe with neat block diagram the operation of a uninterruptible power supply. What are its various topologies?

($5 \times 12 = 60$ marks)

G 5262 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

DIGITAL PROTECTION OF POWER SYSTEMS – (Elective III) (E)

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 4 *marks.*

1. What is need of protection in power systems?
2. Mention the various causes of faulty in power system.
3. What are the advantages of computer application in protective relaying?
4. What is a voltage transformer?
5. List the applications of computer in the protection of power systems.
6. What are the main constraints in the computer application in the protection of power systems?
7. What is meant by phase locked loop?
8. How alternators can be protected against loss of excitation?
9. What is the condition to be satisfied for the operation of reactance relay?
10. Draw the generalised program flowchart of distance relay.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*

Each question carries 12 *marks.*

11. Briefly explain about the instrument transformers used in protection circuit.

Or

12. Explain the working of analog to Digital converters.

Turn over

13. Explain how to simulate a current transformer.

Or

14. Discuss about the applications of computer in protective relaying.

15. Explain the offline applications of computers.

Or

16. Explain the relay co-ordination programmes.

17. Discuss about the microprocessor based protective relays.

Or

18. Discuss about the working of multistage frequency relay.

19. Discuss about the realisation of directional impedance relay using a microprocessor.

Or

20. How can a quadrilateral distance relay be realised using a microprocessor.

(5 × 12 = 60 marks)

G 5263 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

INSULATION TECHNOLOGY – Elective-III (E)

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*

Each question carries 4 *marks.*

1. Discuss the temperature classification of insulating materials.
2. Discuss the electrical and mechanical properties of insulating materials.
3. What are partial discharges? Give examples.
4. Discuss the terms related to dielectrics : polarizability and dielectric strength.
5. Discuss Lorentz equation of internal field.
6. What are absorption currents?
7. Explain Paschen's law.
8. Why electronegative gases have high breakdown field stress?
9. How does internal discharges lead to beakdown in solid dielectrics?
10. Explain current-field characteristics in breakdown of pure liquids.

(10 × 4 = 40 marks)

Part B

Answer **all** *questions.*

Each question carries 12 *marks.*

11. Discuss the applications, preparation and properties of the following materials :

    (a) Ceramics ; (b) Teflon ; (c) PCB.

Or

12. Discuss the effect of moisture on insulation. Also explain the protection of insulation against moisture.

Turn over

13. Write short notes on the following :

    (a) Measurement of resistivity.

    (b) Complex permittivity.

    (c) Permittivity of mixtures.

Or

14. Explain any suitable method for measurement of dielectric loss and constant.

15. Explain the following :

    (a) Electronic polarisation.

    (b) Interfacial polarisation.

Or

16. Explain surge phenomena in HV Transform and the design procedure to withstand surges.

17. Explain Streamer theory of breakdown in gases. Compare Townsend and Streamer mechanisms.

Or

18. (a) How does atmospheric conditions affect breakdown process?

    (b) The breakdown voltage of air in a uniform field for an electrode separation of 2 cm is 58 KV at 760 mm Hg 25° C. Calculate the breakdown voltage for the same gap at 750 mm Hg and 40° C.

19. Explain the following theories of breakdown in solids :

    (a) Intrinsic breakdown.

    (b) Thermal breakdown.

Or

20. Explain the various theories of breakdown in commercial liquid dielectrics.

(5 × 12 = 60 marks)

G 5266 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

VLSI TECHNOLOGY (Elective III) [E]

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Define Fick's Law.
2. What is meant by etching? Briefly explain about ion etching.
3. Briefly explain about the alloyed contacts.
4. Define SILO.
5. Draw the layout of CMOS inverter.
6. Compare bipolar technology with CMOS technology.
7. How is cell hierarchy helpful in layout of VLSI circuits?
8. Briefly explain about the difference between ratiod and non-ratiod logic.
9. Explain the crystal structure of GaAs.
10. Explain why SI is not suitable for RF integrated circuits.

(10 × 4 = 40 marks)

Part B

Each full question carries 12 *marks.*

11. Explain in detail about vertical and lateral projector ranges.

(12 marks)

Or

12. Write short notes on :
    (a) Modulation transfer function.
    (b) Stopping power.

(6 + 6 = 12 marks)

Turn over

8th EEE

13. Explain the different isolation mechanisms in IC fabrication.

(12 marks)

Or

14. (a) Explain different way of threshold voltage (V_{th}) control.

(b) Briefly discuss how monolithic capacitor and resistors are fabricated.

(6 + 6 = 12 marks)

15. Discuss in detail about the BiCMOS fabrication process sequence.

(12 marks)

Or

16. (a) Explain in detail about the CMOS technologies.

(b) Explain about P-Well process.

(6 + 6 = 12 marks)

17. (a) Explain Non-restored logic.

(b) Realize a 3-input NAND gate using BiCMOS logic.

(4 + 8 = 12 marks)

Or

18. (a) Briefly discuss bus lines arrangement in CMOS logic system.

(b) Briefly explain bout power supply rail distribution in CMOS.

(6 + 6 = 12 marks)

19. (a) Briefly explain about sub-micron CMOS technology and its advantage.

(b) Briefly discuss about *n* type and *p* type dopant in GaAs. Also explain how Si can act as both *n* type and *p* type dopant in GaAs.

(6 + 6 = 12 marks)

Or

20. Explain different device-models for MOS.

(12 marks)

[5 × 12 = 60 marks]

G 5178 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

POWER SYSTEM ANALYSIS (E)

(Regular/Supplementary)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. Give the procedure for formulation of Y-bus wing singular transformation.
2. Draw a general circuit which can be used to determine the zero sequence network of a two winding transformer. Using this circuit, draw the zero sequence network of delta-delta transformer.
3. Write and explain load flow equations.
4. Give reasons for :
   (a) Newton-Raphson method is preferred to Gauss Siedal method for load flow studies.
   (b) One of the buses is taken as slack bus in load flow studies.
5. Discuss about optimal load dispatch.
6. Write and explain exact transmission loss formulae and modified co-ordination equation.
7. Distinguish between symmetrical and unsymmetrical faults.
8. Draw a diagram showing the inter connection of sequence networks for single line to ground fault.
9. Give the necessary equations for solving swing equation by Runge-Kutta method.
10. Draw diagram to illustrate the application of equal area criterion to study transient stability for a sudden increase in input of the generator.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. A power system has the impedances between various buses as :

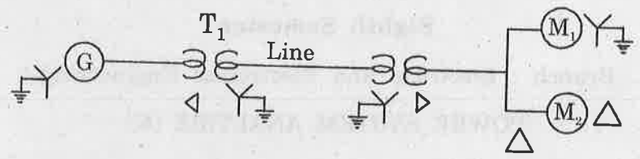
    bus 1 to reference $j2\Omega$, bus 2 reference $j2\Omega$, bus 3 to reference $j2\Omega$,, bus 1 to bus 3 $j0.2\Omega$, bus 2 to bus 3 $j0.4\Omega$, bus 1 to bus 4 $j0.2\Omega$, bus 2 to bus 4 $j0.2\Omega$, bus 3 to 4 $j0.1\Omega$.

    Draw a configuration of the system and find bus admittance matrix. (12 marks)

Or

Turn over

12. For the power system shown below draw reactance diagram. Indicate p.u. reactances Motor 2 : 60 MVA, 3 phase, 11 kV, X = 15% , Line reactance is 80% Select suitable base values. Draw reactance diagram. Indicate p.u. reactance on the diagram.



(12 marks)

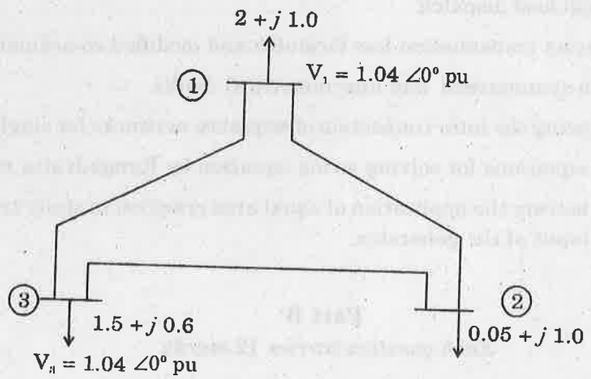
13. Draw and explain the flowchart f_0 load flow solution using Gauss-Seidel method. (12 marks)

Or

14. A 3-bus system is shown below. The series impedance and shunt admittance of each line are $(0.0197 + j\,0.0788)$ p.u. and $j\,0.04$ p.u. respectively. The bus specifications, power input etc. at the bus is as under :

Bus	P_G	Q_G	P_L	Q_L	Bus voltage
1	–	–	2.0	1.0	1.04 p.u.
2	0.5	1.0	–	–	unspecified
3	–	–	1.5	0.6	1.04 p.u.

Find voltage of bus 2 by N–R method.



(12 marks)

15. (a) Discuss about optimal load dispatch. (6 marks)

(b) Describe co-ordination equations and their physical interpretation. (6 marks)

Or

16. Write short notes on :

(a) Automatic load dispatching. (6 marks)

(b) Economic dispatch with losses. (6 marks)

17. What are the different types of faults in power systems ? Describe the analysis of unsymmetrical fault using Z-bus. (12 marks)

Or

18. (a) Write explanatory notes on :

(i) Selection of circuit breakers.

(ii) Use of reactors . (8 marks)

(b) Derive equations for sequence currents for a double-line to ground fault. (4 marks)

19. (a) Distinguish between steady state, transient and dynamic stability. Derive power angle equation. Define transfer reactance. (7 marks)

(b) Discuss the effect of clearing time on stability. (5 marks)

Or

20. Describe the various methods of improving system stability. (12 marks)

[5 × 12 = 60 marks]

G 5208

(Pages : 3)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2013

Eighth Semester

Branch : Electrical and Electronics Engineering

ELECTRICAL SYSTEM DESIGN (E)

(Regular/Supplementary)

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

Part A

Each question carries 4 *marks.*

1. What are the factors to be considered when fixing up the dimensions of the armature slot of a DC machine ?
2. Derive the output equation of a DC Machine.
3. Explain short time and intermittent rating of transformer.
4. Sketch the cross-section of 4 stepped core of a transformer and mark the dimensions. What are its advantages over square core ?
5. Compare water wheel and turbo alternators.
6. What are the factors to be considered for the choice of average flux density in the air gap of a 3 phase induction motor.
7. What are the general requirements of factory lighting ?
8. Calculate the size of conductor to be used for wiring a 15 hp, 400V, 3 phase induction motor. The efficiency = 85% and power factor = 0.8.
9. Explain the merits and demerits of outdoor substations. What are its applications ?
10. Draw a sketch of pipe earthing.

(10 × 4 = 40 marks)

Part B

Each question carries 12 *marks.*

11. A 4 pole, 400 V, 960 r.p.m. shunt motor has an armature 0.3 m in diameter and 0.2 m in length. The commutator diameter is 0.22 m. Give full details of a suitable winding for an average flux density of 0.55 Wb/m^2 in the air gap. Give a sectional view through a slot, showing the details of insulation and arrangement of conductors.

Or

Turn over

12. (a) Describe the design procedure of shunt field winding of d.c. machine. (8 marks)

    (b) What is Carter's coefficient ? Explain. (4 marks)

13. Determine the main dimensions of the core, the number of turns and the cross-sectional area of the conductors in the primary and secondary windings of a 100 kVA, 2200/480 V single phase core type transformer to operate at 50 Hz. Given ; approximate voltage per turn, 7.5 V ; maximum flux density, 1.2 Wb/m^2 ; ratio of effective cross-sectional area of core to square of diameter of circumscribing circle, 0.6 ; ratio of height to width of window, 2 ; window space factor, 0.28, current density, 2.5 A/mm^2.

Or

14. Describe the design of a 230V/6-0-6- V transformer.

15. (a) How do you find rotor bar currents of 3 phase induction motor. (4 marks)

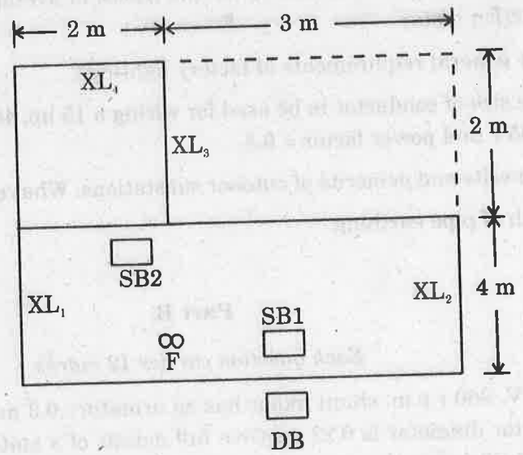
    (b) Find the main dimensions f a 7.5 kW, 220 V, 50 Hz, 4 pole, 3 phase induction motor for best power factor. Give Bav = 0.4 Wb/m^2, ac = 22000 A/m, efficiency = 0.86 ; p.f. = 0.87. Also find main dimensions if the ratio of core length is pole pitch is unity. (8 marks)

Or

16. (a) Write a note on cooling of turbo alternators. (5 marks)

    (b) Find the main dimensions of a 100 MVA, 11 kV, 50 Hz, 1500 r.p.m., 3 phase water wheel generator. Give Bav = 0.65 Wb/m^2, ac = 40000 A/m. Peripheral speed should not exceed 65 m/s. (7 marks)

17. The plan of a small flat is shown below : (a) Calculate size and length of wire required for wiring installation. (b) Estimate the quantity of materials required for teakwood batten wiring system.



L – light

F – Fan

DB – Distribution board.

SB – Switch board.

Or

18. One hall is to be provided with wooden casing-caping wiring. The details are given below :

    Size of hall ; 60 m × 30 m

    Power points ; 10 Nos × 1000 W each

    Light points ; 30 Nos × 60 W each

    Fan points ; 15 Nos × 60 W each

    Plug points ; 30 Nos × 100 W each

    Supply is 3 phase 400 V, 4 wire 50 Hz. Prepare a list of material required for wiring.

19. Draw the layout and give an estimate for power supply arrangement for a bulk industrial consumer.

Or

20. Draw the electrical wiring diagram of a typical automobile.

(5 × 12 = 60 marks)