AR13

CODE: 13CE2003 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MARCH-2017

ENGINEERING GEOLOGY
(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1 a) Define the term Petrology.
b) What is meant by Luster?
c) Define the term Thermal Metamorphism.
d) What is meant by Ore forming mineral?
e) What is the difference between "Normal Fold and Drag Fold "?
f) Define the term Oblique section.
g) What is the difference between Dykes and Sills?
h) Name the types of Unconformities?
i) What is meant Geophysical investigation?
j) What do you meant by outcrop, strike and dip ?

PART-B

ANSWER ALL THE QUESTIONS **[5X12=60]**

UNIT-I

2. Discuss the case study of the failures of some Civil Engineering Constructions due to Geological draw backs.
(a) With reference to Dams
(b) With reference to Bridges **[12M]**

(OR)

3. Write the importance of the following.
(a). Mineralogy (b). Petrology **[12M]**

UNIT-II

4. (a) Differentiate between Rock forming minerals and Ore forming minerals.
(b) Write down any six physical properties of the following minerals
i). Augite ii). Hematite iii). Asbestos
iv). Graphite **[12M]**

(OR)

5. (a). Write a short note upon the different methods related to the study of Minerals.
(b).Discuss the terms Form, Colour, Streak and Transparency. **[12M]**

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UNIT-III

6. (a). Discuss the common structures and textures of Metamorphic rocks.
(b). What is the importance of Petrology to the field of Civil Engineering? **[12M]**

(OR)

7. (a). Discuss the common structures and textures of Igneous rocks.
(b). Compare and Contrast between Sand stone and Lime stone. **[12M]**

UNIT-IV

8. (a). Discuss briefly about the causes and effects of Folding.
(b). Write a short note upon Slip joints and Bedding joints? **[12M]**

(OR)

9. (a). Explain briefly about the classification and types of faults.
(b). Discuss about the bedding joints and oblique joints. **[12M]**

UNIT-V

10. (a). Explain about the necessity of Geophysical Investigations.
(b). Explain the Radio metric method in Geophysical Investigation. **[12M]**

(OR)

11. (a). Discuss briefly the principles of Geophysical study by Gravity method.
(b). Discuss in detail about the methods of Ground water Exploration **[12M]**

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CODE: 13EE2005 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MARCH-2017
ELECTRICAL MACHINES-I
(Electrical & Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

PART –A

ANSWER ALL QUESTIONS **[1 x 10=10M]**

1. a) Write the energy balance equation of a generator?
   b) What is the action of commutator?
   c) What is the function inter poles?
   d) What are the effects of armature reaction in a dc generator?
   e) Define critical speed?
   f) Draw the external characteristics for dc series generator?
   g) What is the condition for maximum efficiency?
   h) What are the protective devices used in a 3 point starter?
   i) Mention any two limitation of Hopkinson's test?
   j) Write the equation to determine stray losses in retardation test?

PART –B

Answer one question from each Unit **[5 x 12 =60M]**

UNIT-I

2. a) Draw and explain fully the general block diagram representation of an electro mechanical energy conversion device? [6M]
   b) A20kW compound generator works on full load with terminal voltage of 230v.the armature, series and shunt field resistance are 0.1, 0.05 and 115 Ω respectively. caluclate the generated emf when the generater is connected as short-shunt? [6M]

(OR)

3. a) For a singly excited magnetic system, derive the relation for the magnetic stored energy in terms of reluctance? [6M]
   b) A 4 pole, lap-wound, dc shunt generator has use full flux per pole of 0.07Wb.The armature winding consists of 220 turns each of 0.004 Ω resistance.caluclate the terminal voltage when running at 900 rpm if the armature current is 50A? [6M]

UNIT-II

4. a) Derive the expression for demagnetizing AT/pole. [6M]
   b) An 8-pole lap-connected dc shunt generator delivers an output of 240A at 500V.The armature has 1408 conductors and 160 commutator segments. If the brushes are given a lead of 4 segments from the no load neutral axis, estimate the demagnetizing and cross magnetising AT/pole. [6M]

(OR)

5. a) Briefly explain the methods of improving commutation? [6M]
   b) Briefly explain the effect of armature reaction with neat diagrams [6M]

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UNIT-III

6. The occ of dc generator driven at 400 rev/min as follows:

Field current(a)	2	3	4	5	6	7	8	9
Terminal volts	110	155	186	212	230	246	260	271

Find: [12M]

i) Voltage to which the machine will excite when run as a shunt generator at 400rev/min with shunt field resistance equal to 34 Ω.
ii) Resistance of shunt circuit to reduce the o.c voltage to 220v.
iii) Critical value of shunt field circuit resistance.
iv) The critical speed when the field circuit resistance is 34 Ω

(OR)

7. a) Explain the OCC characteristics of dc shunt generator? [6M]
b) Two shunt generators operating in parallel deliver a total current of 250A.one of the generators is rated 50kW and the other is100kW.The voltages rating of both machines is 500v and have regulations of 6 per cent (smaller one) and 4 percent. Assuming liner characteristics determine (a) the current delivered by each machine (b) terminal voltage. [6M]

UNIT-IV

8. a) Derive the torque equation of a dc motor? [4M]
b) A 6-pole ,500-v wave –connected shunt motor has 1200 armature conductors and use full flux/pole of 20 mWb.The armature and field resistance are 0.5 Ω and 250 Ω respectively what will be the speed and torque developed by the motor when it draws 20A from the supply mains? Neglect armature reaction. If magnetic and mechanical losses amount to 900W, find (i) use full torque (ii) output in kW and (iii) efficiency at this load. [8M]

(OR)

9. a) Write neat diagram explain the operation and protective device of a 3 pointer starter? [6M]
b) Explain the two speed controlling methods of DC motor. [6M]

UNIT-V

10. a) Explain with neat circuit diagram how a brake test is conducted on a dc shunt motor? [6M]
b) In Hopkinson's test on 250-v machines, the line current was 50A and the motor current 400A not including the field currents of 6 A and 5A .The armature resistance of each machine was 0.014 Ω.caluclate the efficiency of each machine. [6M]

(OR)

11. a) Explain with neat circuit diagram how field's test is conducted on a two similar dc series motors? [6M]
b) A 220v, 14.92 kW dc shunt motor when tested by the Swinburne method gave the following results: Running light: armature current was 6.5 A and field current 2.2 A. with the armature locked, the current was 70A. When a potential difference of 3 V was applied to the brushes. Estimate the efficiency of the motor when working under full load conditions? [6M]

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CODE: 13ME2006 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MARCH-2017

ENGINEERING METALLURGY & MATERIAL SCIENCE
(Mechanical Engineering)

Time: 3 hours **Max Marks: 70**

PART – A

Answer all questions **[10x1 = 10M]**

1. (a) What is critical cooling rate?
   (b) What are the constituents of maraging steels?
   (c) What are miller indices?
   (d) What is space lattice?
   (e) What is malleability?
   (f) Sketch cooling curve of pure iron.
   (g) What is meant by compacting?
   (h) What is annealing?
   (i) What do you mean by strain hardening?
   (j) What is grain refinement?

PART – B

Answer one question from each unit **[5x12 = 60M]**

UNIT – I

2. (a) Explain the crystal deformation mechanisms.
   (b) Find the packing factor of F C C, B C C space lattices.

(OR)

3. (a) Explain interstitial compounds, inter metallic compounds and electron compounds.
   (b) Explain the Hume Rothery rules for maximum solid solubility.

UNIT – II

4. Explain Iron Carbide phase diagram. Explain different phases in detail.

(OR)

5. Sketch and label a binary phase diagram whose components are completely soluble in each other in liquid state and completely insoluble in solid state. Explain important points in it.

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CODE: 13ME2006 **SET-2**

UNIT – III

6. (a) Write about method of experiment and construction of T T T diagram of hypo eutectoid steel.
   (b) Define and distinguish Annealing and Normalizing.

(OR)

7. (a) Explain stainless steels.
   (b) Briefly explain the properties of Copper and its alloys. What are the types of Copper alloys?

UNIT – IV

8. Explain stress strain curve of a mild steel specimen and explain the salient points.

(OR)

9. What is meant by Creep? Explain different Creep mechanisms.

UNIT – V

10. Explain different methods manufacturing of Metal Powders. What are the design considerations in Powder Metallurgy?

(OR)

11. Explain the manufacturing methods of Compacting a metal Power? Describe sintering process.

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MARCH-2017

PROBABILITY THEORY & STOCHASTIC PROCESSES
(Electronics and Communication Engineering)

Time:3 hours **Max Marks: 70**

PART-A

Answer all questions **[10 X 1= 10M]**

1. a) When are two events statistically independent.
   b) List the axioms of probability.
   c) Define probability density function.
   d) Define moment generating function.
   e)What are the parameters of binomial distribution.
   f) Sketch the probability density function of exponential random variable.
   g) State central limit theorem.
   h) How cross correlations and cross power spectral densities are related.
   i) What is white noise random process.
   j) Define noise figure.

PART-B

Answer one question from each unit. **[5 X 12=60M]**

UNIT-I

2.a) Establish the relation between joint and conditional probabilities. [6M]

b) A company producing electric relays has three manufacturing plants producing **50,30 and 20** percent, respectively, of its product. Suppose that the probabilities that a relay manufactured by these plants is defective are **0.02, 0.05 and 0.01** respectively.

(i) If a relay is selected at random from the output of the company, what is the probability that it is defective?

(ii) If a relay selected at random is found to be defective, what is the probability that it was manufactured by plant 2? [6M]

(OR)

3. a) A number is selected at random from {1,2,……,100}.Given that the number selected is divisible by 2, find the probability that it is divisible by 3 or 5. [4M]

b) Consider the binary communication channel. The channel input symbol X may assume the state 0 or the state 1 and similarly the channel output symbol Y may assume either the state 0 or the state 1.Because of the channel noise, an input 0 may convert to an output 1 and viceversa.The channel is characterized by the channel transition probabilities p_o ,q_o, p_1, and q_1, defined by [8M]

$$p_o = P(y_1 \mid x_o) \ \ and \ \ p_1 = P(y_0 \mid x_1)$$

$$q_o = P(y_o \mid x_o) \ \ and \ \ q_1 = P(y_1 \mid x_1)$$

Where x_o and x_1 denote the events (X=0) and (X=1), respectively, and y_o and y_1 denote the events (Y=0) and (Y=1), respectively. Note that **$p_o+q_o=1= p_1+q_1$.Let $P(x_0)=0.5$, $p_0=0.1$, and $p_1=0.2$.**

(i)Find $P(y_0)$ and $P(y_1)$

(ii) If a 0 was observed at the output, what is the probability that a 0 was the input state?

(iii) If a 1 was observed at the output, what is the probability that a 1 was the input state?

(iv) Calculate the probability of error P_e.

UNIT-II

4. a) Write any six properties of probability distribution function. [6M]

b) A noisy transmission channel has a per digit error probability **$p_e=0.01$.** [6M]

(i)Calculate the probability of more than one error in 10 received digits.

(ii) Calculate the probability of more than one error in 10 received digits using the poisson approximation

(OR)

5. a) Define uniform , Gaussian and Rayleigh probability density and distribution functions. [6M]

b) Let **Y=aX+b**. Show that if $X = N(\mu; \sigma^2)$ then $Y = N(a\mu + b; a^2\sigma^2)$ [6M]

UNIT-III

6. a) Write any six properties of joint density function. [6M]

b) Suppose that X and Y are independent normalized normal random variables. Find the PDF of **Z=X+Y.** [6M]

(OR)

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7. a) Explain (i) joint moments about the origin.

(ii) joint central moments [6M]

b) Two random variables X and Y have the joint characteristic function

$$\emptyset_{X,Y}(\omega_1, \omega_2) = \exp(-2\omega_1^2 — 8\omega_2^2)$$

Show that X and Y are both zero mean random variables and that they are uncorrelated [6M]

UNIT-IV

8. a) State and prove any three properties of auto correlation function. [6M]

b) Explain Gaussian and poisson random process. [6M]

(OR)

9. a) Explain wide sense stationary , strict sense stationary and ergodic process. [6M]

b) Consider a random process X(t) defined by [6M]

$$X(t) = A\cos(\omega t + \theta) \quad -\infty < t < \infty$$

Where A and ω are constants and θ is a uniform random variable over

$(-\pi, \pi)$.show that X(t) is WSS.

UNIT-V

10. a) State and prove wiener – khinchin theorem. [6M]

b) Find the mean square value of the random process at the output of an LTI system [6M]

(OR)

11. a) State and prove any three properties of cross power spectral density . [6M]

b)Derive the expression for effective noise temperature of a cascaded network. [6M]

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MARCH-2017

DIGITAL LOGIC DESIGN
(Common to CSE and IT)

Time: 3 Hours **Max Marks: 70**

PART – A

Answer all questions **[10x1=10M]**

1. a) What is the binary equivalent of the decimal number 368

b) The decimal equivalent of hexa decimal number 1A53 is

c) The 2's complement of the number 1101101 is.

d) Which code where all successive numbers differ from their preceding number by single bit?

e) Draw the truth table of Full adder.

f) What is the difference b/w multiplexer & de-Multiplexer

g) What is a PLA

h) How EPROM contents can be erased?

i) How many Flip-Flops are required for mod–16 counter?

j) Give the excitation table for SR flip-flop?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. (a) Convert the following numbers with indicated bases [3×2=6]

i. $(231.23)_8 = (\ )_2$
ii. $(C\ 5\ B)_{16} = (\ )_{10}$
iii. $(734)_8 = (\ )_{16}$

(b) Obtain the 1's and 2's complements of the following binary numbers [3×2=6]

i. 1 1 0 1 1 1 0 0 1 =
ii. 0 0 0 1 0 1 0 1 =
iii. 1 1 0 0 01 1 1 =

(OR)

3. (a) Minimize the function F(w,x,y,z) using algebraic modifications. Show the result as a sum of products with a minimum number of literals..

F(w,x,y,z) = (y'+wy'(xz+xz'))z + (xy'+(x+y)'+z')'+ y(z+wx'(w'+z)) [6]

(b) Express the following function in sum of Minterms and product of Maxterms. [6]

F(A, B, C, D) = AC + $\bar{A}$D + B $\bar{C}$ D

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UNIT-II

4 (i) Minimize the given Boolean function using K-Map and implement the simplified function using NAND gates only F(A, B, C, D) =Σm(0, 1,2,9, 11, 15) + d(8, 10, 14).
(ii) (A) Express the Boolean function: F = AB +AC +AD in a sum of minterms form.
(B) Implement two input XOR gate using NOR gates only. [12]

(OR)

5 (a) Explain carry propagation in parallel adder with a neat diagram. [6]

(b) Implement the full subtractor using a 8:1 multiplexer.. [6]

UNIT-III

6. (a) Implement the function: $F(A,B,C)=\overline{A}\,\overline{B}C+\overline{A}\,B\overline{C}+A\,BC+A\,\overline{B}\,\overline{C}$ using a 4 : 1 multiplexer?[6]

(b) Design an Excess-3 to BCD code converter. [6]

(OR)

7.a) Draw a neat logic circuit of single-bit comparator and explain. [6]

b) What is an encoder? Design octal to binary encoder? [6]

UNIT-IV

8. a) Implement the following functions using 3 inputs, 3 product terms and 2 output PLA : [6]
$F_1 = A\overline{B}+AC$
$F_2 = AC + BC.$
b) Draw a neat figure and explain PLA? [6]

(OR)

9.a) Design a combinational circuit using a ROM that accepts a 3 bit number and generates an output binary number equal to the square of the input number. [8]
b) Explain the features of PAL. [4]

UNIT-V

10. a) Explain the working of the master slave JK flip-flop [6]
b) Design a 4 bit serial in-serial out shift register using JK flip-flop [6]

(OR)

11. (a) Design modulo 3-counter using S-R flip-flop. [6]
(b) Explain how SR-FF is converted into D-FF. [6]

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