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SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech. I Semester Supplementary Examinations, Jan / Feb-2016

ENGINEERING GEOLOGY
(CIVIL ENGINEERING)

Time: 3Hours   Max Marks:70

PART –A

ANSWER ALL QUESTIONS   **[1x10=10M]**

1. a) Name a mineral exhibiting,"Birefringence" (Double Refraction)
    b) Name a mineral of variable hardness.
    c) Name a mineral of foliated structures.
    d) Name a volcanic rock.
    e) Which rock contains more fossils?
    f) Name the toughest Metamorphic rock.
    g) What is cataclastic texture?
    h) Name a Residual Rock.
    i) Which structure is developed because of Tangential Compression?
    j) What is the relation between Dip and Strike?

PART –B

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

UNIT- I

2. Elaborate the importance of Geology for Civil Engineers.

(OR)

3. What is PHYSICAL Geology? What is its influence on Minerals and Rocks?

UNIT- II

4. a)   Define a Mineral.
    b)   Differentiate between
            i)   Colour and Streak
            ii)   Cleavage and Fracture
            iii)   Hardness and Specific Gravity as applicable to minerals.

(OR)

5. Differentiate between the Physical properties, Chemical Composition and uses of
    a) Feldspar   and Quartz
    b) Muscovitemica and Biotitemica
    c) Haematite and Magnetite

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UNIT- III

6. a) Describe the different forms of Igneous Rocks.
   b) Give out the Properties, Mineralogical Composition and uses of
      i) Dolerite   ii) Sand stone   iii) Quartzite

(OR)

7. Compare the similarities and differences between:
   a) Granite and Gneiss   b) Shale and Slate   c) Limestone and Marble

UNIT- IV

8. With neat figures describe the various types of Folds.

(OR)

9. a) With a neat figure explain the various components of a normal fault.
   b) How the reverse fault is different from the Normal fault? Elaborate.

UNIT- V

10. Describe
    i) Any one Magnetic Method.
    ii) Any one seismic method of Geophysical Investigations.

(OR)

11. Describe the importance of Geophysical Studies Stating their importance in Engineering applications.

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CODE:13EE2005
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech. I Semester Supplementary Examinations, Jan / Feb-2016
ELECTRICAL MACHINES – I
(ELECTRICAL & ELECTRONICS ENGINEERING)

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

PART – A
Answer all questions   [1X10=10]

1(a) Express the torque equation in the multiple excited systems.
 (b) Define the co-energy and energy in non linear magnetic system.
 (c) What are the two functions of a commutator in dc machine?
 (d) What component causes a generator to produce direct current rather than alternating current?
 (e) What is the significance of critical resistance in DC generators?
 (f) What is the need for cross connection of field windings?
 (g) Justify, the use of dc series motor for electric traction?
 (h) Write the parameters which affect the speed of the dc motor
 (i) What is the type of test to be performed to find friction and windage losses in DC Machine?
 (j) Why Swinburne's test is preferred instead of Brake test in DC machines?

PART – B
Answer one question from each unit   **[5 X12 = 60]**

UNIT – I

2 (a) Explain the mechanical energy and work done in singly excited system when actual
    displacement occurs?   [6 M]
 (b) Show that the torque developed in a doubly excited magnetic system is equal to the rate of
    increase of field energy with respect to the displacement at constant currents.   [6 M]
(OR)
3 (a) Derive the e.m.f.equation of a D.C.generator.   [4 M]
 (b) A 4 pole long shunt generator supplies 80A at terminal voltage of 400V. If R_a is 0.04Ω, R_{se}
    Is 0.08 Ω, R_{sh} is 80 Ω find generated e.m.f. take brush drop is 1V per brush   [8 M]

UNIT- II

4 (a) Explain the effects of armature reaction in a D. C generator and discuss briefly the methods
    to minimize these effects.   [6 M]
 (b) A 4 - pole generator supplies a current of 286 A. It has 984 armature conductors (i) wave-
    wound (ii) Lap - wound. When delivering full load, the brushes are given an actual lead of
    10^0. Calculate the demagnetizing amp-turns/pole. The field winding is shunt connected and
    takes   10 A. Find the number of extra shunt field turns necessary to neutralize this
    demagnetization.   [6 M]
(OR)
5 (a) Explain the function of commutator in dc machine   [6 M]
 (b) The armature of 6 pole dc generator has a wave winding containing 664 conductors.
    Compute the generator EMF when flux per pole is 0.06 Weber and the speed is 250 RPM.
    At what speed must be the armature an EMF of 250 V if the flux per pole is reduced to
    0.058 Weber.   [6 M]

UNIT – III

6 (a) Explain the load characteristics of dc compound generator. [5 M]

  (b) The open circuit characteristics of a shunt generator at 800 RPM gives:

    Field current (A): 0   0.5   1.0   2.0   3.0   4.0   5.0

    Induced emf (V): 10   50   100   175   220   245   262

    Find graphically the critical resistance of shunt field circuit. If the field circuit resistance is changed to 75 Ω what will be the critical speed for the machine to build up. [7 M]

(OR)

7 (a) State the need for parallel operation. What are the conditions to be satisfied to connect to DC generators parallel? Explain. [6 M]

  (b) A 4 pole dc shunt generator supply a current of 143 A. It has 492 conductors on the armature lap connected while delivering full load: the brushes are given an actual lead of 10 degree. Calculate the magnetizing ampere turns per pole. The filed winding is shunt connected and takes 10A. Find the number of extra shunt field turns necessary to neutralize the demagnetization. [6 M]

UNIT – IV

8. (a) Derive the expression for torque of a D.C.motor ? [5 M]

  (b) A 220 V D.C series motor has armature and field resistances of 0.15 Ω and 0.10 Ω respectively. It takes a current of 30 A from the supply while running at 1000 rpm. If an external resistance of 1 Ω is inserted in series with the motor, calculate the new steady state armature current and the speed. Assume the load torque remains constant. [7 M]

(OR)

9. (a) Explain, what is the need for speed control of DC machines? How to achieve the above the rated speed in DC shunt motor? [6 M]

  (b) A 500 V dc shunt motor has R_a= 1.5 Ω and R_{sh} = 400 Ω respectively. When running on no load the current taken is 5 A and the speed is 1000 rpm. Calculate the speed when motor is fully loaded and the total current drawn from the supply is 30 A. Also estimate the speed at this load, if the shunt field current is reduced by 15%. [6 M]

UNIT – V

10. A 50 KW, 440 V shunt generator having an armature circuit resistance including inter- pole winding of 0.15 ohm at normal working temperature was run as a shunt motor on no-load at rated voltage and speed. The total current drawn by the motor was 5 A including shunt field current of 1.5 A. Compute the efficiency of the shunt generator at 3/4th full-load. [12M]

(OR)

11. (a) Explain the process to predetermine the efficiency of dc motor by using Swinburne's test. [6 M]

  (b) The Hopkinson test on two similar dc shunt machines gave the following results:

    Line voltage: 220V; Line current excluding filed current: 40A; Armature current of motoring machine: 200A; field currents are 6 A and 7 A. Calculate the efficiency of each of the machine at the given load conduction. The armature resistance of each machine is 0.05Ω. [6 M]

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMOUS)
II B.Tech. I Semester Supplementary Examinations, Jan / Feb-2016
PRODUCTION TECHNOLOGY
(MECHANICAL ENGINEERING)

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

PART-A

Answer all questions   **[10X1=10M]**
1 a)   List different types of sands used for molding?
   b)   What is meant by charge in cupola?
   c)   Describe the principle of Arc welding ?
   d)   How TIG is different from MIG?
   e)   Classify various flames in gas welding process.
   f)   Write the principle involved in Resistance welding Process.
   g)   Compare advantages of cold working over hot working process.
   h)   Classify rolling mills used in industry?
   i)   Classify the extrusion processes.
   j)   Define explosive forming.

PART – B

Answer one question from each unit   **[5 x 12 = 60 M]**
UNIT-I
2.(a) Write a short notes on pattern allowances and explain about any two
   (b) Sketch the components of gating system.
(OR)
3. (a) List various defects in casting and suggest any two remedies for any two casting defects.
   (b) What is a pattern? Explain various materials that are generally used for preparing patterns?
UNIT-II
4. With a neat sketch explain the working principle of TIG Welding. What are the advantages,
    Limitations and applications of that process?
(OR)
5. With a neat sketch explain the working principle of Thermit Welding. What are the
   advantages, Limitations and applications of that process?
UNIT-III
6. (a) What do you understand about recrystallization and grain growth?
   (b) Differentiate between Hot working and Cold working of metals with their advantages and
       disadvantages.
(OR)
7. (a) Briefly explain the principle of rolling with a neat sketch. List out various advantages,
       disadvantages and applications.
   (b) Explain with neat sketches various roll arrangements used in Rolling mills.
UNIT-IV
8. Explain with sketches the difference between direct and indirect extrusion. Give two examples
   of components produced by extrusion.
(OR)
9, Distinguish between wire drawing and tube drawing with neat sketches. Also list out various
   advantages and disadvantages.
UNIT-V
10. Explain briefly the following plastic processing methods.
    a) Compression moulding
    b) Transfer moulding
(OR)
11. With a neat sketches explain explosive forming and electro hydraulic forming

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech. I Semester Supplementary Examinations, Jan / Feb-2016
PROBABILITY THEORY AND STOCHASTIC PROCESSES
(Electronics and Communication Engineering)

Time : 3 Hours   **Max Marks: 70**
PART – A
Answer all questions   **[1X10=10M]**

1. (a) Define random experiment.
   (b) Write any two axioms of probability.
   (c) The diameter of an electric cable is a continuous random variable with density function
   $$f_X(x) = \begin{cases} 6x(1-x) \text{ for } 0 < x < 1 \\ 0 \text{ } elsewhere \end{cases}$$
   Find the CDF of X.
   (d) Define the density function of exponential distribution.
   (e) Mention two applications of Gaussian distribution.
   (f) Define moment generating function.
   (g) Define joint distribution function.
   (h) When two random processes are uncorrelated?
   (i) A wss random process x(t) is applied to the input of an LTI system whose impulse response is $5te^{-2t}$. The mean of x(t) is 3. Find the mean of output of the system.
   (j) What are the important requirements of the front-end stage of communication receiver in the point of view of noise?
PART – B

Answer one question from each unit   **[5X12=60M]**
UNIT – I

2. a) Define conditional probability with an example.   [6M]
   b) Suppose a coin is tossed thrice. Let the event A be "getting three heads" and B be the   [6M]
      event of "getting a head on the first toss". Show that A and B are not independent events
                                        (OR)
3. a) State and prove Bayes theorem.   .   [6M]
   b) A shipment of components consists of three identical boxes. One box contains 2000   [6M]
      components of which 25% are defective, the 2nd box has 5000 components of which 20%
      are defective and the 3rd box contains 2000 components of which 600are defective. A box is
      selected at random and a component is removed at random from the box. What is the
      probability that this component is defective? What is the probability that it came from the
      second box.
UNIT – II

4.a) Consider the probability density $f_X(x) = a.e^{-b|x|}$ where X is random variable whose
   allowable values range from x = -∞ to +∞. Find (i) the CDF (ii) the relation between a and b
   (iii) the probability that x lies between 1 and 2   [6M]
   b)Explain Poisson random variable in brief.   [6M]

(OR)

5.a) Life time of IC Chips manufactured by a semiconductor is approximately normally   [6M]
distributed with mean 5×10^6 hours and standard deviation of 5×10^5 hours. A mainframe
manufacturer requires that at least 95% of a batch should have a lifetime greater than 4×10^6
hours. Will the deal be made.

   b) Find the mean, variance and moment generating function of uniform distribution.   [6M]

UNIT – III

6. a) The joint density function of the random variables X and Y is given as   [6M]
       $f_{XY}(x,y) = 8xy$ for $0 \leq x \leq 1, \quad 0 \leq y \leq x$
             $= 0$ otherwise
     Find (i) Marginal density of X (ii) Marginal density of Y (iii) Conditional density of X
       (iiii) Conditional density of Y
   b) Define conditional distribution and conditional density function of two random variables X
     and Y.   [6M]

(OR)

7. a) State and prove Central limit theorem.   [8M]

   b) The joint distribution of X and Y is given by $f_{XY}(x,y) = 4xy\, e^{-(x^2 + y^2)}, x \geq 0, y \geq 0$
     Show that X and Y are independent random variables.   [4M]

.   UNIT – IV

8. (a) Explain stationary random process.   [6M]
   (b) What is autocorrelation function? Mention its properties.   [6M]

(OR)

9. State and prove properties of Cross correlation function   [12M]

UNIT – V

10. a) Define the following random processes (i) Band pass (ii) Band limited (iii) Narrow band
                                               [8M]
   b) Write short notes on noise suppression   [4M]

(OR)

11. Define signal to noise ratio, noise figure and equivalent noise temperature of a receiver.
    Are signal to noise ratio and noise figure related?   [12M]

Code: 13EC2006
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech. I Semester Supplementary Examinations, Jan / Feb-2016
DIGITAL LOGIC DESIGN
(COMPUTER SCIENCE ENGINEERING)
Time: 3 Hours   Max Marks: 70
PART- A

Answer all questions [10 X 1= 10 M]

1. a) What are the two steps in Gray to binary conversion?
    b) What are combinational circuits?
    c) What are the universal gates in boolean algebra?
    d) Define magnitude comparator.
    e) Define priority encoder.
    f) What are the different classifications of binary codes?
    g) What are the advantages of 1's complement subtraction.
    h) List basic types of programmable logic devices.
    i) What is programmable logic array?
    j) Write the applications of MUX.

PART-B
Answer one question from each unit [5x12=60M]

UNIT-I
2.(a) Given the two Binary numbers X= 1010100 and Y= 1000011, perform the subtraction X-Y
   by using 1's and 2's compliments. [6]

  (b) How many literals and variables does the following function have in this form?
   F=a'bc+a'bcd+c'd' [6]

(OR)
3. (a) Simplify the following Boolean expression using thermos [6]
        F = (A+B')(C+A'B)' ,   G=AB'+C(A'+B)

  (b) List at least two useful applications of parity and explain how parity is used for these
applications. [6]
UNIT-II
4. Design a 4 bit carry look ahead adder circuit. [12]

(OR)

5. Draw the minimum NAND-NAND and minimum NOR-NOR implementation for F.   [12]

     $F(A,B,C,D)= \Sigma m(1,5,8,13\text{-}15)+D(3,10,12)$

UNIT-III

6. (a) Draw the logic diagram of a two-to-four-line decoder using (a) NOR gates only (b) NAND gates only. Include an enable input.   [6]

   (b) Construct a 16 X 1 multiplexer with two 8 X 1 and one 2 X 1 multiplexers. (Use block diagrams)   [6]

(OR)

7. (a) Construct a 5-to-32 line decoder with four 3-to-8-line decoders with enable and a 2-to-4-line decoder. Use block diagrams for the components.   [6]

   (b) Implement 64×1 multiplexer with four 16×1 and one 4×1 multiplexer.(Use only block diagram)   [6]

UNIT-IV

8. Implement the following Boolean functions using PAL.   [12]

     $w(A,B,C,D) = \Sigma m (0,2,6,7,8,9,12,13)$

     $x (A,B,C,D) = \Sigma m (0,2,6,7,8,9,12,13,14)$

     $y (A,B,C,D) = \Sigma m (2,3,8,9,10,12,13)$

     $z (A,B,C,D) = \Sigma m (1,3,4,6,9,12,14)$.

(OR)

9. (a) Draw and explain the block diagram of PAL.   [6]

   (b) Write the comparison between different PLDs   [6]

UNIT-V

10. (a) Draw and explain 4-bit universal shift register.   [6]

    (b) Explain different types of shift registers.   [6]

(OR)

11. a) Explain the operation of Jhonson counter   [6]
    b) Convert SR flip flop to JK flip flop   [6]