AR16

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What is the significance of engineering geology in major civil engineering projects?   7M

   b) List down the various physical properties of minerals studied for identification of minerals? Explain in brief about any six physical properties of minerals used in identification of minerals.   7M

(OR)

2. a) Explain the importance of physical geology, petrology and structural geology in civil engineering.   7M

   b) Distinguish between a mineral and rock ? List down the various methods used for identification of minerals and explain any two methods.   7M

UNIT-II

3. a) Give a brief about classification of sedimentary rocks.   7M
   b) Give a brief about textures exhibited by igneous rocks.   7M

(OR)

4. a) Give a brief about classification of metamorphic rocks.   7M
   b) Distinguish between texture and structure of rocks. Explain structures exhibited by metamorphic rocks.   7M

UNIT-III

5. a) Distinguish between strike and dip with sketch. Distinguish between normal faults and reverse faults.   7M

   b) Give a brief about various types of folds exhibited by rocks.   7M

(OR)

6. a) What do you understand about unconformities? What is the importance of unconformities in civil engineering?   7M

   b) What is the importance of folds and joints in civil engineering?   7M

UNIT-IV

7. a) Give a brief about types of dams with sketch.   7M

   b) What is the influence of strike & dip of rocks, folds, faults and joints in tunnelling?   7M

(OR)

8. a) Give a brief about geological considerations in selection of dam site.   7M

   b) What is the influence of competency of rocks, position of groundwater table, porosity, permeability of the rocks in tunnelling?   7M

UNIT-V

9. a) What is the importance of geophysical investigations in civil engineering? List down various important geophysical methods and principle of electrical resistivity method?   7M

   b) Give a brief about electrical resistivity method and its applications in civil engineering.   7M

(OR)

10. a) What are the advantages of electrical method and seismic methods over other geophysical methods?   7M

    b) Give a brief about gravity method of investigation and its applications.   7M

CODE: 16EE2009   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Regular & Supplementary Examinations, Nov / Dec- 2018

POWER SYSTEMS-I
(Electrical and Electronics Engineering)

Time: 3 Hours   Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What are the factors to be considered for selection of the site for a thermal station — 7M
   b) What are the functions of economiser and super heater in a thermal plant? — 7M

(OR)

2. a) How the hydel plants are classified? Discuss briefly — 9M
   b) Write short note on (i) penstock (ii) water hammer and surge tank — 5M

UNIT-II

3. a) Write short note on importance of solar power generation. — 6M
   b) Write short note on solar energy collector and point focusing collector — 8M

(OR)

4. a) What are the advantages of the nuclear power station? — 4M
   b) What are the classifications of the reactors? Describe briefly. — 10M

UNIT-III

5. a) Write the differences between radial and ring main distribution systems. — 6M
   b) A DC 2 wire distribution AB 300 meters long is fed from both ends and supplies a uniformly distributed load of 0.15 A per meter length together with the following concentrated loads: 50 A at C, 60 A at D and 40 A at E, distance AC, CD and DE being 75m, 100 m and 50 m respectively. If the supply voltage at A and B is 205 and 200 V respectively and resistance of each conductor is 0.00015 ohm per meter, calculate the current supplied at each end the point of minimum potential. — 8M

<div align="center">**(OR)**</div>

6. a) Draw the single line diagram of Air insulated substation?   6M
   Explain.
   b) What is the difference between indoor and outdoor   8M
   substations? What are the factors which are to be
   considered for a selection of a site of a substation?

<div align="center">## UNIT-IV</div>

7. a) Define the following with respect to the economic aspects   8M
   of power generation i) Load duration curve, ii) Demand
   factor, iii) Diversity factor and iv) Maximum demand
   b) A Domestic lighting installation having fifteen 60 watt   6M
   lamps is operated as follows:
   i) 5 lamps from 6 p.m till 8 p.m ii) 10 lamps from 8 p.m
      till 10 p.m. iii) 6 lamps from 10 p.m till 12 p.m
      Determine the demand factor and the daily load factor.

<div align="center">**(OR)**</div>

8. a) Discuss the flat rate and block rate tariff methods for cost   7M
   calculation of generation.
   b) A Consumer has an annual consumption of 70,080 kwh.   7M
   The charge is rs 100 per kw of maximum demand plus 5
   paise per kwh. Find the annual bill and the overall costs
   per khw if the load factor is 40%

<div align="center">## UNIT-V</div>

9. a) Explain in detail about Capacitance grading   7 M
   b) Explain classification of cables and discuss their general   7M
   construction with neat sketch

<div align="center">**(OR)**</div>

10. a) Draw and explain about single line diagram of gas   7M
    insulated substation
    b) List the advantages and disadvantages of Gas-insulated   7M
    substation.

CODE: 16ME2009   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Regular & Supplementary Examinations, Nov / Dec- 2018
ADVANCED ENGINEERING DRAWING
(Mechanical Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. A square prism, with the side of its base 40 mm and axis 70 mm long is lying on one of its base edges on the H.P. in such a way that this base edge makes an angle of 45° with the V.P. and the axis is inclined at 30° to the H.P. Draw the projections of the solid using the 'auxiliary plane method.   14M

(OR)

2. A square pyramid of 50 mm side of base and 50 mm length of axis is resting on one of its triangular faces on the H.P. having a slant edge containing that face parallel to the V.P. Draw the projections of the pyramid using auxiliary projection method.   14M

UNIT-II

3. A cube of 35 mm long edges is resting on the H.P. on one of its faces with a vertical face inclined at 30° to the V.P. It is cut by a section plane, inclined at 60° to the V.P. and perpendicular to the H.P., so that the face which makes 60° angle with the V.P. is cut in two equal halves. Draw the sectional front view, top view and true shape of the section.   14M

(OR)

4. A square pyramid, base 40 mm side and axis 65 mm long, has its base on the H.P. and all the edges of the base equally inclined to the V.P. It is cut by a section plane, perpendicular to the V.P., inclined at 45° to the H.P. and bisecting the axis. Draw its sectional top view, sectional side view and true shape of the section.   14M

UNIT-III

5. A cylinder of 40mm diameter, 60mm height and having its axis vertical, is cut by a section plane, perpendicular to the VP, inclined at 45^0 to the HP and intersecting the axis 35mm above the base draw its front view, sectional top view and true shape of the section.   14M

(OR)

6.   A cone, base 45 mm diameter and axis 55 mm long is resting on the   14M
H.P. on its base. It is cut by a section plane, perpendicular to both the
H.P. and the V.P. and 6 mm away from the axis. Draw its front view,
top view and sectional side view.

UNIT-IV

7.   A cone, diameter of base 50 mm and axis 65 mm long, is lying on the   14M
H.P. on one of its generators with the axis parallel to the V.P .It is cut
by a horizontal section plane 12 mm above the ground. Draw its
development of its surface.

(OR)

8   Draw the development of the lateral surface of the part 'P' of the   14M
pentagonal prism as shown in fig. below.
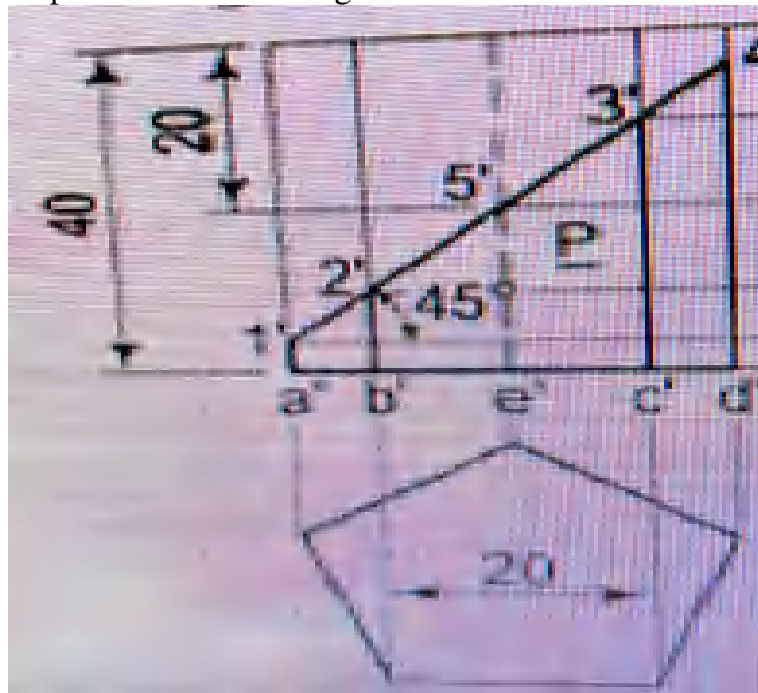
UNIT-V

9.   A vertical cylinder of 80 mm diameter is penetrated   by another   14M
cylinder of 60 mm diameter, the axis of which is parallel to both the
H.P. and the V.P. The two axes are 8 mm apart. Draw the projections
showing curves of intersection.

(OR)

10.   A vertical cone, diameter of base 75 mm and axis 100 mm long, is   14M
completely penetrated by a cylinder of 45 mm diameter. The axis of
the cylinder is parallel to the H.P. and the V.P. and intersects the axis
of the cone at a point 28 mm above the base. Draw the projections of
the solids showing curves of intersection.

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Regular & Supplementary Examinations, Nov / Dec- 2018
ELECTRICAL TECHNOLOGY
(Electronics and Communication Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	Explain the power stages of DC Generator, give various losses in a DC machine	**14M**
	(OR)	
2.	A 4-pole long shunt lap wound Generator supplies 25KW at a terminal voltage of 500v. The armature Resistance is 0.03Ω, series resistance is 0.04Ω and shunt field resistance is 200Ω. The brush drop may be taken as 1V. Determine the energy generated and calculate the number of conductors if the speed is 1200rpm and flux per poleis 0.02wbs. Neglect armature reaction.	**14M**

UNIT-II

3.	a)	Explain the operation of a single phase transformer with inductive load by drawing the phasor diagram?	**7M**
	b)	Derive the EMF equation of a single phase transformer.	**7M**
		(OR)	
4.		A 10 KVA 500/100v transformer has the following circuit parameters referred to primary resistance R_{01}=0.3 Ω reactance X_{01}=5.2 Ω. When supplying power to a lagging load the current power and V_g measured on primary side were 20A, 8KW and 500v respectively. Calculate V_g on secondary terminals under these conditions.	**14M**

UNIT-III

5.	a	Derive the torque equation of a three phase induction motor	**7M**
	b	Draw and explain the torque –slip characteristics of three phase induction motor	**7M**
		(OR)	
6.	a	Explain the principle and operation of three phase induction motor.	**7M**
	b	Explain the difference between Slip Ring and Squirrel induction motors.	**7M**

UNIT-IV

7.		Explain the synchronous impedance method to calculate voltage regulation of alternator	**14M**
		(OR)	
8.	a	Explain the principle and operation of Alternator.	**7M**
	b	Explain the constructional features of Alternator.	**7M**

UNIT-V

9.		Explain the construction and the working principle of Moving Iron instrument. Write advantages and disadvantages	**14M**
		(OR)	
10.		What are the types of torques associated for the working of measuring instrument and explain them with necessary diagrams.	**14M**

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Regular & Supplementary Examinations, Nov / Dec- 2018

FREE OPEN SOURCE SOFTWARE
(Common to CSE & IT)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Discuss the advantage of Free software, FOSS usage.	8M
	b)	Explain the features of FOSS and compare it with commercial software..	6M

(OR)

2.	a)	Describe the features of python.	6M
	b)	Write a Python program to convert height in feet and inches to cm.	8M

UNIT-II

3.	a)	Explain all the conditional statements in Python with an example for each.	6M
	b)	Write a Python program to print all prime numbers less than 256.	8M

(OR)

4.	a)	What are 4 built-in numeric data types in Python? Explain.	8M
	b)	Describe Python jump statements with examples.	6M

UNIT-III

5.	a)	Write a Python program that interchanges the first and last characters of a given string.	6M
	b)	Give a comparison between lists, tuples, dictionaries and sets.	8M

(OR)

6.	a)	Explain in detail about dictionaries in Python.	7M
	b)	Discuss about tuples in Python.	7M

UNIT-IV

7.	a)	Explain loop constructs in Perl	8M
	b)	Explain Perl parsing rules.	6M

(OR)

8.	a)	Explain the variable types in Perl with a suitable example	6M
	b)	Explain different control statements in Perl	8M

UNIT-V

9.		Explain the different subroutines in Perl	14M

(OR)

10.	a)	Write a Perl program to copy contents of one file to another file.	8M
	b)	What are packages in Perl?	6M

AR13

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

PART-A

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

    a) Name different branches of geology
    b) What is Petrology?
    c) Distinguish between rock and mineral
    d) Distinguish between fracture and cleavage?
    e) Define dip and strike.
    f) Give the classification of metamorphic rocks
    g) What is non-confirmity?
    h) What are Columnar joints?
    i) Write the physical properties of a mineral.
    j) What are the geo physical investigation method?

PART-B

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

UNIT-I
2.   Describe any TWO case histories where there is failure of civil engineering structures due to geological drawbacks

(OR)

3.   Explain the geological considerations for tunnelling.

UNIT-II
4.   Classify different rock forming minerals and describe the important features of the pyroxene and mica group.

(OR)

5.   Explain about the following minerals: (i) Hematite (ii) Bauxite

UNIT-III
6.   Explain the following in relation to igneous rocks: (i) Dykes (ii) Sills

(OR)

7.   Give the megascopic description of (i) Basalt and (ii) Gneiss

UNIT-IV
8.   Draw a neat sketch and label the parts of fold. Explain briefly about the classification of folds.

(OR)

9.   Explain the causes and effects of faulting in rocks

UNIT-V

10.   Explain about the Gravity method of geophysical exploration.

(OR)

11.   What is the principle of Electrical resistivity method? What are the advantages and disadvantages of the method?

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CODE: 13EE2006   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Nov / Dec-2018
ELECTRO MAGNETIC FIELDS
(Electrical & Electronics Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

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

1.
   a) Write mathematical expression for Divergence theorem.
   b) What is the use of Gauss's law?
   c) Define dielectric strength.
   d) Write Laplace's equation and its applications.
   e) Define magnetic flux density .
   f) What is scalar magnetic potential?
   g) Define self-inductance.
   h) Define magnetic moment?
   i) State Lenz's Law.
   j) State Faraday's law of electromagnetic induction.

PART-B

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

UNIT-I

2. a   Derive an expression for electric field intensity at point P due to   6M
        an electric dipole.
    b   Given that $D = (5r^2/4)$ ar $C/m2$. Evaluate both the sides of   6M
        divergence theorem for the volume enclosed by r=4m and $\theta=\pi/4$.

(OR)

3. a   Find the gradient of scalar system $t = x^2y+e^z$ at point P(1,5,-2).   5M
    b   Derive the electric field due to an infinite uniformly charged   7M
        sheet.

UNIT-II

4. a   Find the expression for the cylindrical capacitance using   6M
        Laplace's equation.
    b   Two parallel conducting plates area separated by distance 'd'   6M
        apart and filled with dielectric medium having ε_r as relative
        permittivity. Using Laplace's equations derive an expression for
        capacitance per unit length of parallel plate capacitor, if it is
        connected to a DC source supplying 'V' volts.

(OR)

5. a Derive an expression for the capacitance of a spherical capacitor 8M consisting of 2 concentric spheres of radius 'a' & 'b'.
   b What are the salient points to be noted when the boundary 4M conditions are applied?

UNIT-III

6. a List the similarities and differences between Coulomb's and 7M Biot-Savart law.
   b Derive the expression for curl H=J. 5M

(OR)

7. a State Ampere's circuital law, and explain any two applications 6M of Ampere's circuital law.
   b Find the magnetic field at a point P(0.01, 0, 0)m if current 6M through a co-axial cable is 6 A. which is along the z-axis and a=3mm, b=9mm, c=11mm.

UNIT-IV

8. a State the importance Lorentz Force equation. 6M
   b A solenoid has an inductance of 20 mH. If the length of the 6M solenoid is increased by two times and the radius is decreased to half of its original value, find the new inductance.

(OR)

9. An iron ring with a cross sectional area of 8 cm2 and 12M circumference of 120 cm is wound with 480 turns wire carrying a current of 2 A. A relative permeability of ring is 1250. Calculate the flux established in the ring.
   Derive an expression for inductance of a solenoid with N turns and *l* metre length carrying a current of I amperes

UNIT-V

10. a Derive the expression for inductance of a toroidal coil 6M carrying current I, with N turns and the radius of toroid R.
    b Write the Maxwell's equations for static and time varying 6M fields.

(OR)

11. a Derive expression for pointing vector. 6M
    b In free space, $E = 50\cos(\omega t - \beta x) a_z$ V/m. Find the average 6M power crossing a circular area of radius 2.5m in the plane z=0. Assume Em = Hm . η_o and $\eta_o = 120\pi\Omega$.

AR13

CODE: 13ME2006   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, Nov / Dec-2018
ENGINEERING METALLURGY & MATERIAL SCIENCE
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

<u>**PART-A**</u>

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Write example of a metal that crystallizes as BCC
   b) How coring is eliminated?
   c) Give an example of interstitial compound
   d) Write peritectoid reaction
   e) What is austempering?
   f) Give the composition of Muntz metal
   g) Write any austenite stabilizing element
   h) What is endurance limit?
   i) Give one application of powder metallurgy
   j) How to produce powders of pure quality?

<u>**PART-B**</u>

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

<u>**UNIT-I**</u>
2. (a) What are Miller indices and give examples?   6M
   (b) Give an account of dislocations   6M

(OR)
3. (a) Distinguish between slip and twinning   6M
   (b) Distinguish between substitutional solid solutions and interstitial solid solutions   6M

<u>**UNIT-II**</u>
4. (a) State and explain lever rule with examples   6M
   (b) Explain the necessity and method of age hardening   6M

(OR)
5. (a) Explain equilibrium cooling of a hypereutectic alloy   6M
   (b) Discuss the microstructure and properties of various phases appearing in Fe-Fe$_3$C diagram   6M

<u>**UNIT-III**</u>
6. (a) Explain the construction of TTT diagrams   6M
   (b) Describe various kinds of stainless steels   6M

(OR)
7. (a) Describe the microstructure, properties and applications of malleable iron and SG iron   6M
   (b) Describe any three titanium base alloys   6M

<u>**UNIT-IV**</u>
8. (a) Distinguish between engineering strain and true strain. How these are evaluated?   6M
   (b) Explain any method of impact testing. What is the inference obtained by it?   6M

(OR)
9. (a) What do you understand by hardness and toughness? How these are quantified?   6M
   (b) What is creep? Explain creep testing procedure.   6M

<u>**UNIT-V**</u>
10. (a) Explain in detail various steps involved in powder metallurgy   12M

(OR)
11. (a) What the characteristics of metal powders?   6M
    (b) Describe various compaction methods   6M

AR13

CODE: 13EE2008   SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations, Nov / Dec-2018
ELECTRICAL TECHNOLOGY
(Electronics and Communication Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

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

1. a) Define Faraday Law of Electro Magnetic Induction
   b) Give classification of DC motors
   c) How the iron losses be reduced to a minimum in a transformer?
   d) Give classification of Transformers
   e) Define Torque of an induction motor
   f) Draw the Torque-slip characteristics of induction motor.
   g) Name different types of Alternators
   h) Define Pitch factor.
   i) Give the classification of measuring instruments
   j) What is the necessity of damping torque in measuring instruments?

PART-B

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

UNIT-I

2. a) From the first principles, derive an equation for torque developed in a D.C. Motor   6M
   b) List the types of DC Generators and give their applications   6M

(OR)

3. a) Explain the working of a 3-point starter with a circuit diagram for a DC shunt motor   6M
   b) A 20 kw, 250 V d.c. shunt generator has armature and field resistances of 0.04Ω and 200Ω respectively. Determine the total armature power developed when working i) as generator delivering 20 kw output and ii) as a motor taking 20 kw input.   6M

UNIT-II

4. a) Obtain the equivalent circuit of a single-phase transformer. Explain how to evaluate the equivalent circuit of a transformer from open circuit and short circuit tests.   6M
   b) A 5 kVA, 220 / 110 volts, 1-phase transformer has a maximum efficiency of 96.97 % at 0.8 p.f. lagging. It has a core loss of 50 watts and the full load regulation at 0.8 p.f. lagging is 5 %. Find the efficiency and regulation at full load 0.9 p.f. lagging   6M

(OR)

5. a) Obtain an expression for the regulation of a single-phase transformer from its equivalent circuit / phasor diagram.   6M
   b) A 20 kVA, 2500 / 250 volts, 50 Hz, 1-phase transformer gave the following test results: O.C. test (L.V. side): 250 V, 1.4 A, 105 W; S.C. test (H.V. side): 104 V, 8 A, 320 W. Compute the parameters of the approximate equivalent circuit referred to L.V.   6M

1 of 2

6	a)	Explain why the rotor of polyphase induction motor can never attain synchronous speed.	4M
	b)	A 10 kW, 400 V, 3-phase, 4-pole, 50 Hz delta connected induction motor is running at no load with a line current of 8 A and an input power of 660 watts. At full load, the line current is 18 A and the input power is 11.20 kW. Stator effective resistance per phase is 1.2 Ω and friction, windage loss is 420 watts. For negligible rotor ohmic losses at no load, calculate, i) stator core loss; ii) total rotor losses at full load; iii) total rotor ohmic losses at full load; (iv) full load speed; v) internal torque, shaft torque and motor efficiency	8M

(OR)

7.	a)	Derive the expression for starting torque of a three phase induction motor.	4M
	b)	A 60 kW, 400 V, 3-phase, 6-pole, 50 Hz wound rotor induction motor has full-load slip of 0.04 when operating at rated voltage and frequency with rotor winding short circuited at slip rings. The slip at maximum torque is 0.2. Stator resistance and rotational losses are neglected. Determine i) the maximum torque and ii) full-load rotor ohmic losses. Rotor resistance is now doubled by adding external series resistance in each rotor phase. For the rated power output, determine iii) slip at maximum torque iv) full-load slip and v) full-load torque.	8M

UNIT-IV

8.	a)	Explain the principle and operation of Alternator	6M
	b)	Find the synchronous impedance and reactance of an alternator in which a given field current produces an armature current of 200A on short circuit and a generated emf of 50V on open circuit. The armature resistance is 0.1Ω. To what induced voltage must the alternator be excited if it is to deliver a load of 100A at a pf of 0.8 lagging, with a terminal voltage of 200V.	6M

(OR)

9.	a)	Define voltage regulation of an alternator. Explain synchronous impedance method of determining regulation of an alternator	6M
	b)	Calculate the voltage induced per phase in a 3 phase 50 Hz, alternator having a flux per pole of 0.1515 wb. The no. of conductors in series are 360. Assume full pitch coil with a distribution factor of 0.96.	6M

UNIT-V

10.	a)	What is different damping arrangements used in measuring instruments	6M
	b)	With a neat sketch explain in detail moving iron repulsion type instrument	6M

(OR)

11.	a)	Give the importance of controlling torque in the measuring instruments.	4M
	b)	Explain the constructional details of PMMC instruments with a neat sketch	8M

AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, Nov / Dec-2018

ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CSE & IT Branches)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) What are the limitations of Ohm's Law?
    b) Two resistors of 4 Ω and 6 Ω are connected in parallel. If the total current is 30 A, find the current through each resistor.
    c) What is the need of starter in a DC Machine?
    d) What is the need for commutator in a DC machine?
    e) Define magnetizing and no-load components of a single-phase transformer.
    f) Define slip of an Induction motor.
    g) Define secondary instruments.
    h) Which type of signals are measured using Moving iron instrument?
    i) Write the applications of SCR.
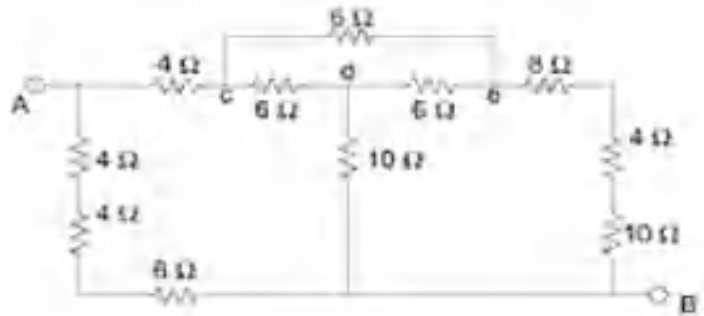   j) Difference between PNP and NPN transistors.

PART-B

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

UNIT-I

2. a) Using delta to star transformation for the given circuit. Find equivalent resistance between terminal AB   6M
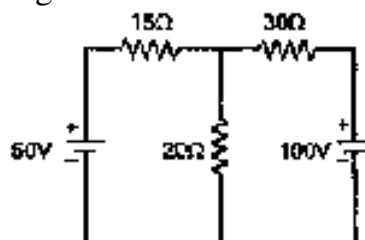

    b) Calculate the equivalent capacitance if three capacitors of capacitances 2, 4, and 8 micro – Farads are connected in 1) Series 2) Parallel   6M

(OR)

3. a) Calculate the current through 20Ω resistor.   6M

    b) Explain in detail the volt-ampere relationship of R, L and C elements with neat diagrams.   6M

UNIT-II

4. a) Explain different types of armature windings in DC machines.   6M
   b) A 6 pole DC machine has 400 conductors and each conductor can   6M
      carry 80A.Flux/pole is 0.020 Wb and the machine is driven at 1800
      rpm. Calculate power developed in armature and electromagnetic
      torque if conductors are i) Wave connected and ii) Lap connected.

(OR)

5. a) Derive the induced emf for DC generator.   6M
   b) A 4 pole, lap wound, d.c. generator has a useful flux of 0.07 Wb per   6M
      pole. Calculate the generated e.m.f. when it is rotated at a speed of 900
      r.p.m. with the help of prime mover. Armature consists of 440 number
      of conductors. Also calculate the generated e.m.f. if lap wound
      armature is replaced by wave wound armature.

UNIT-III

6. a) Briefly explain the losses in transformers.   6M
   b) Explain the principle operation of 3-Ø Induction motor.   6M

(OR)

7. a) Derive the e.m.f equation in alternator.   6M
   b) The primary of a 50Hz, step-down transformer has 480 turns and is fed   6M
      from 6400V supply. Find (i) the peak value of the flux produced in the
      core, and (ii) the voltage across the secondary winding if it has 20
      turns.

UNIT-IV

8. With neat diagram explain the working of moving iron instrument.   12M
   Write the advantages and disadvantages of moving iron instrument

(OR)

9. With neat diagram explain the working of moving coil instrument.   12M
   Write the advantages and disadvantages of moving coil instrument

UNIT-V

10. a) Explain the working of NPN transistor with neat circuit.   6M
    b) Explain the working of SCR and draw its characteristics.   6M

(OR)

11. Explain the working of full wave rectifier.   12M

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