

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JANUARY-2018

PROGRAM : DIPLOMA FIRST SEMESTER

COURSE CODE : DEET104

COURSE TITLE : BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

Section (A)

Q. 1. Attempt all questions.

(2 x 10 = 20)

- What is the effect of temperature on resistance?
- What is conductance and its unit?
- If a resistor is to dissipate energy at the rate of 250 W find its resistance for a terminal voltage of 100V.
- What is flux density?
- What is electric power? And how many watt in 2 MW?
- What is the quality of insulator explain?
- What is the majority and minority in P type and N type semiconductor?
- Color code of 200 k Ω , 100 Ω 5k Ω
- What is resonance circuit? And what element we use in resonance circuit
- What is contactor?

Section (B)

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- A capacitor having a capacitance of 10 μ f is connected in series with a non- inductive resistance of 120 Ω across a 100 V 50 Hz supply. Calculate a) the current b) the phase difference between the current and the supply voltage and c) the power.
- With reference to the network of fig by applying thevenin's theorem ,find the following :
the equivalent e.m.f. of the network viewed from terminals A and B. the equivalent resistance of the network when looked into from terminals A and B. and current in the load resistance.

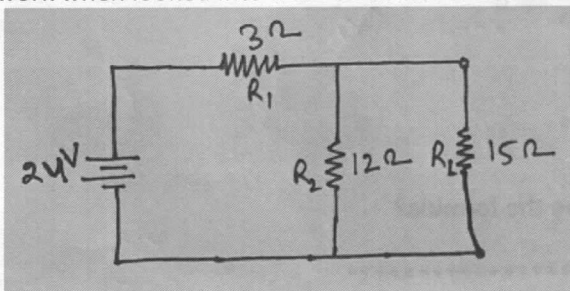


Fig1

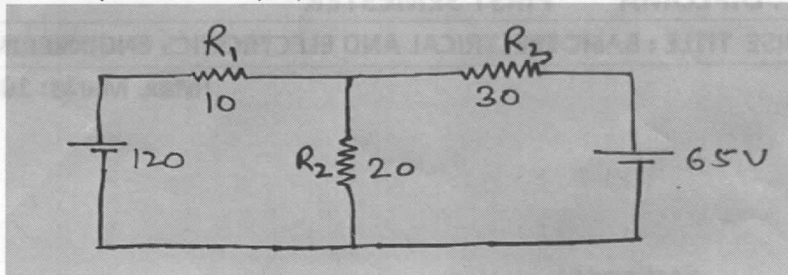
- Give the relation between the star and delta line and phase voltage and current relations.
- Explain the kirchoff's law with their proper diagram.
- Explain the full wave rectifier with working and proper diagram
- What is the voltage and current divider rule drive the formulae.
- What is the inductor? Explain there all type of inductors.

Section (C)

Attempt **any 3** questions.

(15 x 3 = 45)

- Q. 3. a.** By means of superposition theorem. Find the current which flow through R_2 in the circuit of:



- b.** Find that inductor follow the ohm's law.

(10)

(5)

- Q. 4. a.** What is the resonance circuit derived the equation for resonance circuit, power factor of the series circuit. (7.5)

- b.** What is capacitor? Explain all the type of capacitors. (7.5)

- Q. 5. a.** A series RLC circuit has the following parameter value: $R=10\Omega$ $L=0.01$ H and $C=100\mu\text{F}$ voltage source 10V, $\omega=1000\text{rad/s}$. Find impedance of the circuit, power dissipated in the circuit, frequency of the circuit, bandwidth and quality factor (10)

- b.** The coil has induction of 25mH and negligible resistance. Calculate its reactance at :

- 50 Hz
- 2kHz
- 1.5 MHz

(10)

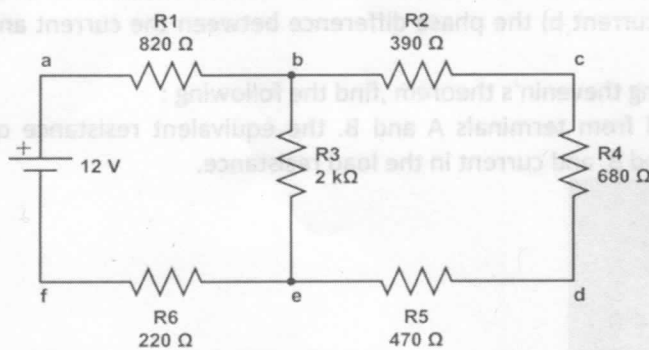
(5)

- Q. 6. a.** What is BJT? Explain the junction transistor structure BJT and the working principle of a transistor. (7.5)

- b.** What is the material explain all the type of material and explain the type of semiconductor. (7.5)

- Q. 7. a.** Find the current with the help of Kirchhoff's law.

(10)



- b.** What is the permeability of free space? Derive the formula?

(5)

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END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA(EE/CSE/ECE) THIRD SEMESTER

COURSE CODE : DEET204/DCST204/DECT204**COURSE TITLE : DIGITAL ELECTRONICS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)**Attempt **all** Questions:-**(2*10=20)****Q. 1-**

- a. What is BCD Code?
- b. What is the significance of K-Map?
- c. What is ASCII code?
- d. Write the help of truth table explain working of NAND & NOR Gate?
- e. Differentiate between a volatile and non volatile memory.
- f. List the names of 7400 & 7408 ICs.
- g. What is a Race around condition in flip flop?
- h. What is a Buffer?
- i. What is EX-NOR gate?
- j. Discuss the types of ROM in brief.

Section (B)Attempt **any five** Questions:-**(5*7=35)****Q. 2-**

- a. Convert the following number into-----

$$\begin{aligned}(1024)_{10} &= (?)_2 \\ (A5D)_{16} &= (?)_2 \\ (22)_{10} &= (?)_{\text{Excess-3}} \\ (11011)_2 &= (?)_8 \\ (0.125)_{10} &= (?)_2 \\ (600)_{10} &= (?)_{16} \\ (1011)_{10} &= (?)_{\text{gray}}\end{aligned}$$

b.

- i. Draw the logic circuit for Boolean equation $f(a,b,c,d) = \sum (1,3,5,7,9,11,13,15)$
- ii. $f(a,b,c,d) = \sum (0,1,4,5,8,9,12,13) + d(2,3,6,7,10,11,14,15)$

c.

- i. What are the limitations of half adder? Discuss full adder.
- ii. Discuss Demorgan's law in detail.

- d. What is the basic difference between DeMultiplexer & Decoder? Draw the logic circuit of 1X8 De-Mux.
- e. With the help of truth table & logic diagram explain the working of one bit comparator?
- f. What is Multiplexer? Write the application of Mux. Draw the 8X1 Mux logic circuit.
- g. Differentiate between A/D & D/A converters. Explain R-2R ladder network.

Section (C)

Attempt any three Questions :-

(3*15=45)

Q. 3-

- a. What is the basic difference between combinational & Sequential circuits? Explain the working of R-S flip flop. (7.5)
- b. Explain the working of J-K flip-flop in detail. (7.5)

Q. 4-

- a. What is the basic difference between buffer register & shift register? Explain 4 bit shift register with timing diagram. (7.5)
- b. With the help of logic diagram and truth table explain T flip flop. (7.5)

Q. 5-

- a. What is the basic difference between Analog signal & Digital signal? Write the advantage of digital instrument over analog instruments. (7.5)
- c. What are counters? Explain the working of 4 bit ripple counter. (7.5)

Q. 6-

- a. What is Tristate switch? Give the different applications of XOR gate. (7.5)
- b. Prove Boolean equation $(A+B.C) = (A+B)(A+C)$. Also solve the function $F(a,b,c,d) = \sum (0,2,4,6,8,10,12,14)$ with SOP method. (7.5)

Q. 7-

- a. What is memory? Write the type of memory and define RAM, PROM, ROM, EEPROM. (7.5)
- b. Write shorts on- (7.5)
 - i. Gray codes
 - ii. Octal Number System
 - iii. 2's complement
 - iv. Excess-3 code

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JANUARY-2018

PROGRAM : DIPLOMA(EE)

THIRD SEMESTER

COURSE CODE : DEET205

COURSE TITLE : ELECTRICAL MACHINES-I

[Time allotted: Three hours]

[Max.Marks:100]

Note: Attempt all Sections & Questions.

Section (A)

Q. 1. Attempt all questions.

(2 x 10 = 20)

- Which values can be determined by performing open circuit and short circuit test on transformer.
- What are various applications of single phase transformer.
- What are kind of transformers are used in electrical power transmission.
- Draw connection diagram of delta-zigzag three phase transformer
- A 4 pole DC machine has 96 slots. Calculate pole pitch of the machine.
- Explain Faraday's left hand and right hand rule.
- What are the different types of compound DC generator.
- What is the meaning of cross magnetization in DC machine.
- Explain why DC series motor has high starting torque.
- What will happen if DC shunt motor is started without a starter.

Section (B)

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Explain the need for using transformer oil for cooling of transformer. What are the physical properties a good transformer oil must have?
- What is voltage regulation of transformer. Explain with phasor diagram for unity power factor.
- Provide a comparison of core and shell type construction of 3 phase transformer with help of diagram.
- Compare external characteristics of shunt and series DC generator.
- Explain main components of DC generators with the help of construction diagram.
- Explain armature resistance speed control method for DC series motor with help of circuit diagram.
- Explain speed- torque characteristics of DC shunt motor.

Section (C)

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3. a. A single phase 10KVA 2400/240 volts 60Hz has constant losses of 100 watts. (7.5)
Transformer runs at load power factor of 0.8. When transformer runs at 50% load the copper losses are 60 watts. Calculate Maximum efficiency of the transformer.
- b. A 5 KVA 600/300 volts 50 Hz single phase transformer has following test results: (7.5)
Open circuit test 200 V, 2.0A, 90 W
Short circuit test 20V, 10A, 100 W
Calculate value of equivalent resistance and reactance referred to high voltage side.

- Q. 4. a. Draw circuit diagram of Scott connection and explain its application. (7.5)
b. Draw and explain connection diagram of delta-star and star-zigzag three phase transformer. (7.5)

- Q. 5. a. Describe following components of DC machine : (7.5)
i. Magnetic Yoke
ii. Armature
iii. Field

- b. Prove that mechanical Torque generated in DC motor is $T_m = \frac{pZ}{2\pi A} \Phi I$ (7.5)

Q. 6. a. A 4 pole wave wound DC has total 900 armature conductors.

Calculate induced EMF in generator when:

- generator is rotating at 500 rpm
- generator is rotating at 1000 rpm

Flux per pole is 3×10^{-3} weber.

- b. A DC shunt generator has constant losses of 800 W. This generator delivers full load current of 190 A at terminal voltage of 220 V. Calculate efficiency of the generator at full load. The armature and shunt resistance are 0.02Ω and 50Ω respectively.

Q. 7. a. A DC series motor has total resistance ($R_a + R_f$) of 1Ω between its terminals.

It runs at 600 rpm taking 10A current at terminal voltage of 200 V.

If terminal voltage is reduced to 100 V with motor still drawing same current of 10 A, calculate new speed of the motor.

- b. Compare and explain speed- load characteristics of DC shunt and series motor.

Section (B)

- Explain the need for using transformer oil for cooling of transformer. What are the physical properties a good transformer oil must have?
- What is voltage regulation of transformer. Explain with phasor diagram for unity power factor.
- Provide a comparison of core and shell type construction of 3 phase transformer with help of diagram.
- Compare external characteristics of shunt and series DC generator.
- Explain main components of DC generator with the help of construction diagram.
- Explain armature resistance speed control method for DC series motor with help of circuit diagram.
- Explain speed-torque characteristics of DC shunt motor.

Section (C)

- Attempt any 3 questions.
- A single phase $100\text{KVA } 2400/240$ volts 60Hz has constant losses of 100 watts. Transformer runs at load power factor of 0.8. When transformer runs at 50% load the copper losses are 60 watts. Calculate Maximum efficiency of the transformer.
 - A $5 \text{ KVA } 600/300$ volts 50 Hz single phase transformer has following test results:
Open circuit test $200 \text{ V } 1.5 \text{ A } 50 \text{ W}$
Short circuit test $20 \text{ V } 10 \text{ A } 100 \text{ W}$
Calculate value of equivalent resistance and reactance referred to high voltage side.
 - a. Draw circuit diagram of Scott connection and explain its application.
b. Draw and explain connection diagram of delta-star and star-delta three phase transformer.
 - a. Describe following components of DC machine:
 - Magnetic Yoke
 - Armature
 - Fieldb. Prove that mechanical Torque generated in DC motor is $T_m = \frac{P_g}{2\pi A}$

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM: DIPLOMA (EE/ECE/BME) THIRD SEMESTER

COURSE CODE: DEET201-DECT205-DBMT205**COURSE TITLE: CIRCUIT THEORY****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

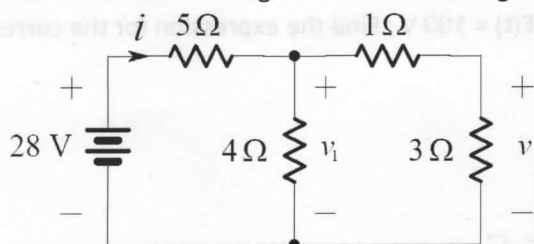
- Write the formula for self-inductance.
- State current division rule.
- Write the formulae used for rectangular to polar conversion.
- Write the well-defined formula for inductive reactance.
- Define resonant frequency.
- Find the value of form factor for ac.
- Define balanced load for three phase loads.
- If phase current for delta connected load is 40A, find line current.
- How can we represent R in frequency domain?
- Find the Laplace transformation for a dc voltage source of 100V.

Section (B)**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

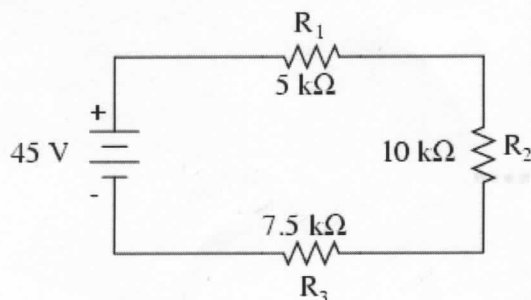
- Explain self-inductance and mutual inductance.
- Derive the expression for Half Power Frequencies of an RLC series circuit.
- Derive the expression for average value of ac.
- Explain the basic concepts for a star connection.
- Derive the expression for voltage across an inductor in frequency domain.
- Derive the expression for Q-factor of an RLC series circuit.
- Show that voltage and current are in phase with each other for ac applied across pure resistor.

Section (C)

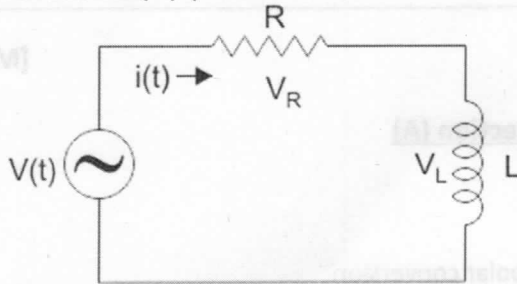
Attempt any 3 questions.

(15 x 3 = 45)**Q.3.** a. Find the current through each resistor using current division rule

b. Find the voltage across each resistor using voltage division rule

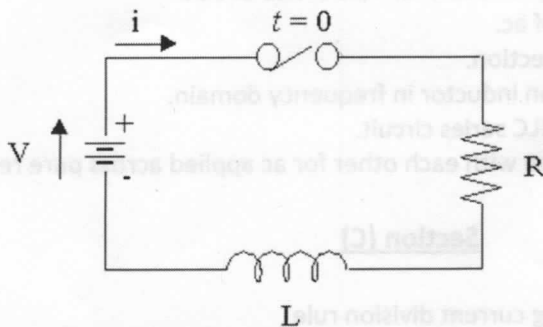


- Q.4.** a. For $R = 75\Omega$, $L = 318\text{mH}$ and $V = 220\text{V}$, 50Hz ; Draw the phasor diagram and find (i) impedance (ii) current (iii) power factor (iv) power consumed.

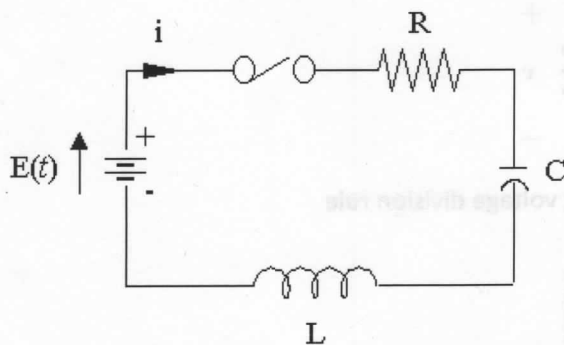


- b. Derive the expression for impedance for RC series circuit using phasor diagram.

- Q.5.** a. Derive the expression for three phase power using two wattmeter method.
b. An RLC series circuit consists of $R = 1000\Omega$, $L = 100\text{mH}$, $C = 10\mu\text{F}$. If the voltage of 100V is applied across the combination, Find (i) the resonant frequency (ii) Q-factor (iii) the half power points.
- Q.6.** a. Show that for a three phase delta connected balanced load line current is $\sqrt{3}$ times the phase current.
b. A balanced Three Phase, delta connected load has per phase impedance of $(15+j40)\Omega$. If 440V , three phase supply is connected to this load, find (i) Phase current (ii) Line current (iii) Power supplied to the load.
- Q.7.** a. For the given circuit $R = 30\Omega$, $L = 15\text{H}$ and $V = 60\text{V}$; Find the expression for the current.



- b. For the given circuit $R = 2\Omega$, $L = 10\text{H}$, $C = 5\text{F}$ and $E(t) = 100\text{V}$; Find the expression for the current.



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Enrol. No.

S R H U

Regn. No.

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END SEMESTER EXAMINATION, JANUARY-2018**PROGRAM : DIPLOMA(E.E) THIRD SEMESTER****COURSE CODE : DEET203****COURSE TITLE : ELECTRICAL DRAWING AND ESTIMATION-1****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Draw the symbol for: 2-way switch and socket (5 A).
- b. Show conduit wiring system with help of neat labelled diagram.
- c. Explain the moving system of energy meter.
- d. Write the advantages of parallel wiring system.
- e. Discuss bracket with holders.
- f. Name the types of electrical insulators used in electric poles and draw diagram of any one.
- g. What are the points that need to be earthed?
- h. Write the formula for: Load factor and Diversity factor.
- i. Draw wiring diagram for 2 Lamps operated by two separate 1-way switch on a switch board.

j. Give names of the equipment shown by symbols:



and

**Section (B)****Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Explain the operation of Intermediate switch with help of proper diagram.
- b. Name and draw any 7 symbols of Switches used in electrical wiring.
- c. What is an Energy meter? Explain its parts with help of a diagram.
- d. What is a staircase wiring? Explain its operation with help of wiring and schematic diagram.
- e. What are the types of wiring that can be used for connecting loads to supply? Explain each with its diagram.
- f. Write down any 7 house wiring rules that you must follow while wiring a house or building.
- g. **DATA:** Make a switch board with following specifications:
 - Gap between accessories: min- 30 mm and max-45 mm
 - Size of a switch: 24mm x 55 mm
 - Size of a Socket: 40 mm x 55 mm
 - Size of a regulator: 40 mm x 44 mm

For the given data:

- i) Show calculations for selecting sheet of appropriate size.
- ii) Also mention the standard size selected after calculation.
- iii) Draw the diagram showing the components on switch board along with their spacing and dimensions on selected board.

Section (C)

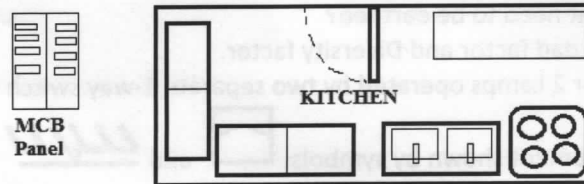
Attempt any 3 questions.

(15 x 3 = 45)

- Q.3.** a. What is looping in a system? Explain with a proper diagram. Draw a wiring diagram showing looping in 3 switches each on one switch board and 2 switches in another switch board. In between two switch boards put 3 bulbs (controlled from first switch board) and do nothing for second switch board output. (10)
- b. Name and draw any 5 electrical symbols from Lighting category that you know have special purpose. (5)

- Q.4.** a. What is the use of cables? Explain the types of cables with help of proper diagrams. (10)
 b. Draw schematic, wiring diagram for following: 2 lamps, 2 fans, 2 regulators, 1 socket (5A), 5 switches on one switch board. (5)

- Q.5.** a. Explain corridor wiring with help of a schematic diagram. Also show corridor wiring with a master switch. What are the advantages of master switch? (10)
 b. Draw a schematic diagram and explain how to control one lamp by a Master OFF switch. Why it is called master OFF switch? (5)
- Q.6.** a. What is Earthing? Explain the types of earthing and their features. (10)
 b. Connect 3 socket (5A, 500 watts), 2 lamps (each 100 watts) and switch for each component in kitchen drawing from MCB panel. Show position of equipments, switches and wiring in diagram. (5)



- Q.7.** a. Why do we need electric poles and towers? What are the properties we need in poles and towers? Name and draw the types of poles and towers. (10)
 b. What is a carbon brush holder? Explain any one type with help of labeled diagram. (5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JANUARY-2018

PROGRAM : DIPLOMA (ECE) THIRD SEMESTER

COURSE CODE : DECT304

COURSE TITLE : INDUSTRIAL ELECTRONICS

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

Section (A)Q. 1. Answer all of the following:

(2*10)

- a. What is UPS?
- b. Discuss the term VDR & TDR.
- c. Discuss microphone as transducer.
- d. What is stand intrinsic ratio?
- e. What is eddy current?
- f. What are the characteristics of a good converter?
- g. Define reverse saturated current.
- h. Discuss in brief DIAC.
- i. What is NTR & PTR?
- j. Define the term PIV.

Section (B)Q. 2. Attempt any five Questions:-

(5*7)

- a. Describe battery charger with the help of suitable diagram.
- b. What are the necessary condition of turning on an SCR?
- c. Explain SCR as full wave rectifier.
- d. Discuss SMPS. Give its operating principle and industrial applications.
- e. Discuss semiconductor strain gauge
- f. What is piezoelectric effect? Discuss crystal oscillator
- g. Explain UJT as a relaxation oscillator

Section (C)Attempt any three Questions:-

(3*15)

Q. 3.

- a. Discuss SCR as overvoltage protection.
- b. Discuss working principle and application of TRIAC.

Q. 4.

- a. Explain thermistor in detail. Give its various applications.
- b. Discuss various types of cycloconverters.

Q. 5.

- a. Explain SCR as three phase full wave rectifier.
- b. With the help of a suitable diagram discuss working potentiometer.

Q. 6.

- a. What do mean by UJT. Discuss its working principle with applications.
- b. Explain thermocouple. Discuss its applications and applications

Q. 7.

- a. Describe the working principle of Dc chopper operation and its types
- b. Explain LVDT. Discuss its construction and working principle with its applications.

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA (BME) THIRD SEMESTER

COURSE CODE : DBMT203**COURSE TITLE : ELEMENTS OF PHYSIOLOGY****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Tidal Volume.
- b. Name the constituents that make up Blood.
- c. Expiratory Reserve Volume.
- d. Residual Volume.
- e. What are the contents present in the product of the Liver.
- f. Functions of Mitochondria.
- g. Name the parts of the Upper Respiratory Tract.
- h. Define Erythrocytes.
- i. Define Acquired Immunity
- j. Name the two muscles involved during respiration.

Section (B)**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Draw a well labeled Diagram of Cell
- b. What is Phagocytosis. Explain the steps.
- c. Write down the functions of Blood.
- d. Functions of Nucleus.
- e. Functions of Saliva.
- f. Draw the structure of a synovial joint.

Section (C)

Attempt any 3 questions.

(15 x 3 = 45)**Q. 3.** a. Draw the Structure of the Heart**(7.5)**

b. Explain the conduction system of the heart.

(7.5)**Q. 4.** a. Draw the Structure for the organ of Hearing**(7.5)**

b. Explain the process of hearing in the human ear

(7.5)**Q. 5.** a. Explain systemic circulation.**(7.5)**

b. Explain the process of Inflammation.

(7.5)**Q. 6.** a. Explain the cycle of breathing.**(7.5)**

b. How does gaseous exchange take place in the cells.

(7.5)**Q. 7.** a. Explain how are impulses transmitted through a synapse**(7.5)**

b. Draw the structure of the basic unit of the nervous system.

(7.5)

Enrol. No.

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END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA(ECE/BME) THIRD SEMESTER

COURSE CODE : DECT202/DBMT202**COURSE TITLE : ELECTRONIC CIRCUITS-I****[Time allotted: Three hours]****[Max. Marks : 100]****Note:** Attempt all Sections & Questions.**Section (A)****(2 x 10 = 20)**

- Q. 1.** Attempt **all** questions.
- What is unipolar transistor?
 - Why BJT is called bipolar?
 - Discuss Rectification.
 - Define PIV voltage.
 - What do you mean by stability factor?
 - What is the advantage of FET over BJT?
 - What is impedance matching?
 - What is load line?
 - Why collector region is made larger than emitter and base?
 - Discuss shunting effect.

Section (B)**(7 x 5 = 35)**

- Q. 2.** Attempt **any 5** questions.
- Why rectifiers are used? Discuss the working of full wave bridge rectifier.
 - Explain Zener diode as a regulator. Discuss zener and avalanche breakdown.
 - Why NPN transistor is preferred over PNP? Explain working of PNP transistor.
 - Why CE amplifier is used in audio application. Give the comparison of CB, CE & CC amplifier.
 - Give the working principle of Light emitting diode with its application.
 - Discuss the working of JFET.
 - Why MOSFET is preferred to JFET. Discuss depletion & enhancement type MOSFET in detail.

Section (C)**(15 x 3 = 45)**

- Attempt **any 3** questions.
- Q. 3.**
- Discuss the working of BJT with common base configuration. (7.5)
 - Explain RC Coupled Amplifier. Why gain fall at lower and upper side of frequency. (7.5)
- Q. 4.**
- Explain transformer coupled amplifier with neat circuit diagram & Frequency response curve. (7.5)
 - Why potential divider bias is called universal biasing. Discuss its working with bypass capacitor (7.5)
- Q. 5.**
- What is thermal runaway condition? Why heat sink plate is used in power transistor? (7.5)
 - What do you mean by h-parameter of transistor? Give the h-equivalent circuit of CE amplifier. (7.5)
- Q. 6.**
- Why low pass filter is used in dc power supply? Discuss π -filter and also find ripple factor in half wave rectifier. (7.5)
 - Discuss single stage amplifier with its frequency response curve & gain (7.5)
- Q. 7.**
- Discuss the working of direct coupled amp (7)
 - Write short notes on: (3+2+3)
 - Photo diode
 - Depletion layer
 - Varactor diode

Enrol. No.

S R H U

Regn. No.

D D

END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA(BME) THIRD SEMESTER

COURSE CODE : DBMT204**COURSE TITLE : BIOMEDICAL INSTRUMENTATION****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)****Q.1.** Attempt all questions.**(2 x 10 = 20)**

- a. What is the significance of Esophagus Temperature?
- b. What is Impedance Pneumography?
- c. What do you mean by Motion Artifacts?
- d. What are the different types of electrodes used for ECG?
- e. Define Secondary Transducer and give one example.
- f. Define Threshold.
- g. What is significance of Isolation?
- h. What is offset voltage?
- i. What is feedback?
- j. Where do you use DAC in Biomedical Instrumentation?

Section (B)**Q.2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Draw the Block diagram of General Instrumentation system and explain briefly.
- b. Explain how the cell potential developed.
- c. Explain how Electrode-Skin contact impedance will be measured for surface electrodes with the help of arrangement diagram.
- d. Write short notes on Potentiometric transducer.
- e. List the different choices available for pre-amplification. Write about them briefly.
- f. Write short notes on Digital Storage Oscilloscope.
- g. What are the advantages and disadvantages of RFID Technology?

Section (C)

Attempt any 3 questions.

(15 x 3 = 45)**Q.3.**

- a. Write about the following terms in brief:
 i. Control system ii. Data Recorder iii. Signal Conditioner iv. Alarms
- b. Draw the bus constructed using Multiplexers and explain its operation?

8

7

Q.4.

- a. What are the advantages and disadvantages of pregelled disposable electrodes?
- b. List and explain the different electrodes used to measure EEG briefly.

7

8

Q.5.

- a. Explain the working principle of Thermocouple.
- b. What is Thermistor? Explain its working principle with neat diagrams.

8

7

Q.6.

- a. Explain the working principle of Instrumentation amplifier.
- b. Draw the Direct writing recorder and explain its operation.

8

7

Q.7.

- a. Explain the principle of operation of Wi-Fi Technology with the help of neat diagrams.
- b. List and explain the applications of Finger Print Detection Technology.

8

7

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END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA(ECE) THIRD SEMESTER

COURSE CODE : DECT203**COURSE TITLE : COMMUNICATION SYSTEM-I****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

Section (A)

Q. 1. Attempt all questions.**(2 x 10 = 20)**

- a. Write an expression for DSBSC modulation. Also draw its frequency domain representation.
- b. Why Vestigial side band modulation is preferred for TV signal over DSB-FC/SC & SSB?
- c. A 600ohm resistor is connected in parallel with 600 ohm antenna input of a radio receiver. If the bandwidth of radio receiver is 20 KHz, Find Noise Power and Noise voltage (Boltzmann constant= 1.38×10^{-23})
- d. What do you mean by Signal to noise Ratio? Why it is required.
- e. Write an expression for Wide band FM signal.
- f. What is a Nyquist rate?
- g. What do you mean by Multiplexing?
- h. Why DSBSC cannot be detected using an Envelop Detector?
- i. Unmodulated carrier frequency is 1MHz. After frequency modulation if maximum frequency is 1.4MHz. Find frequency deviation and minimum frequency.
- j. Write the frequency range for FM and AM signal.

Section (B)

Q. 2. Attempt any 5 questions.**(7 x 5 = 35)**

- a. Discuss Quadrature Amplitude Modulation in detail.
- b. With the help of block diagram explain the generation & reception of FDM.
- c. Discuss pre-emphasis and de-emphasis in details.
- d. With the help of sideband spectrum, explain VSB in detail?
- e. Discuss the various parameters on which performance of a receiver can be measured.
- f. With the help of block diagram explain the basic communication system in detail.
- g. Explain Time Division Multiplexing. How it is different from FDM.

Section (C)

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.** a. What do you mean by Modulation? Discuss its advantages in detail. (7)
b. What is sampling? Why it is required? Discuss its type. (8)

- Q. 4.** a. Derive an expression for NBFM signal & explain its frequency spectrum. (7)
b. What do you mean by Modulation index? Discuss its effect on AM signal (8)

- Q. 5.** a. With the help of a block diagram, Explain Tuned radio frequency receiver in detail. (8)
b. What do you mean by single tone and dual tone modulation technique? What is a pilot carrier? Why it is used? (7)

- Q. 6.** a. Explain the generation and limitations of Single Sideband modulation technique in detail (7)
b. With the help of a block diagram, Explain high power AM transmitters (8)

- Q. 7.** a. With the help of a block diagram, Explain the working of superhetrodyne receiver in detail. (7)
b. A carrier signal of $20 \sin \pi \times 10^5 t$ is DSBSC modulated by a message signal of $10 \sin \pi \times 10^3 t$. Find the bandwidth, transmitted power and also plot frequency spectrum for the same. (8)

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END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM : POLYTECHNIC (ECE) FIFTH SEMESTER

COURSE CODE: DECT301**COURSE TITLE: MICROCONTROLLERS & INTERFACING****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)****Q. 1.** Attempt **all** questions:**(2 x 10 = 20)**

- a. Write any four flags of 8051 microcontroller flag register.
- b. What do you mean by addressing mode of ADDC A, @R0?
- c. Write short note on address and data bus systems in microcontroller.
- d. Explain the function of T0, T1, INTO, INT1 pins of 8051.
- e. Explain the operation of PUSH instruction of 8051.
- f. Give one example of instruction which will change the carry flag.
- g. Explain BSR mode of 8255.
- h. Explain Instruction cycle.
- i. Give two examples of logical I instruction of 8051
- j. What do you mean mnemonics and operand with an example?

Section (B)**Q. 2.** Attempt **any 5** questions:**(7 x 5 = 35)**

- a. Write an assembly language program to add 67H data with 22H. Store the result in the R3 register.
Draw the flow chart also.
- b. Explain the purpose of IP register of 8051.
- c. Explain with an example 4 different addressing modes of 8051 instructions.
- d. What do you mean by delay? Write an assembly language program 4(five) second delay if crystal frequency is 12MHz.
- e. Explain the purpose of TMOD register of 8051.
- f. Write a note on hand shaking signals in 8255 MOD 0 configuration.
- g. What do you mean subroutine and nesting in programming give example.

Section (C)Attempt **any 3** questions.**(15 x 3 = 45)**

- Q. 3.**
 - a. Explain flag register and function of each bit draw suitable diagram (7.5)
 - b. Draw the pin diagram of 8051 and explain TXD, RXD, and RST pins. (7.5)
- Q. 4.**
 - a. What is the role of 8251 interfacing in 8051 system? Explain important characteristics of 8251. (7.5)
 - b. Write a program to find the average of five 8 bit numbers. Store the result in R0.
(Assume that after adding five 8 bit numbers, the result is 8 bit only). (7.5)
- Q. 5.**
 - a. Explain interrupt structure and its operation in 8051 microcontroller (7.5)
 - b. Compare Microprocessor and Microcontroller. (7.5)
- Q. 6.**
 - a. Write a program to add the values of locations 50H & 51H and store the result in locations in 52H & 53H. (7.5)
 - b. Explain PORT1 and PORT0 pins of 8051 microcontroller. (7.5)
- Q. 7.**
 - a. Explain assembler directives with examples. (7.5)
 - b. Write a program to exchange the lower nibble of data present in external memory locations 6000H and 6001H. (7.5)

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END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM : DIPLOMA(ECE) FIFTH SEMESTER

COURSE CODE : DECT302**COURSE TITLE : ADVANCE COMMUNICATION SYSTEMS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

Section (A)

Q. 1. Attempt **all** questions.**(2 x 10 = 20)**

- a. What do you mean by a dominant mode in a waveguide?
- b. Discuss the advantages of satellite communication
- c. What are TE modes in a waveguide?
- d. What is a blind speed?
- e. Why ground wave propagation is not preferred at high frequencies?
- f. Expand IRNSS. Discuss it in brief.
- g. What is a group velocity?
- h. What do you mean by total internal reflection of light?
- i. What is an antenna?
- j. Explain the term Apogee and Perigee with respect to satellite?

Section (B)

Q. 2. Attempt **any 5** questions.**(7 x 5 = 35)**

- a. What are waveguide Tee? With the help of figure, discuss H plane tee.
- b. Explain the concept of cell splitting and frequency reuse in cellular technology.
- c. With the help of diagram, Explain Bunching process, velocity and current modulation in a klystron.
- d. Explain the basic structure of optical fibers with its advantages.
- e. What are scattering parameters? Discuss the properties of S matrix.
- f. What is an orbit? Discuss LEO, MEO & GEO in detail.
- g. With the help of block diagram, explain the working of RADAR. Also discuss its applications.

Section (C)

Attempt **any 3** questions.**(15 x 3 = 45)****Q. 3.** a. Why sectoring is done in cellular technology? Discuss cell splitting as well.**(7.5)**

b. What are the laws of reflections? Also discuss Snell's law.

(7.5)**Q. 4.** a. Discuss GSM architecture in detail.**(7.5)**

b. What do you mean by multiplexing? Explain WDM in detail.

(7.5)**Q. 5.** a. Explain the concept of handoff in cellular technology.**(7.5)**

b. What is an Escape velocity? Differentiate between geosynchronous and geostationary satellite.

(7.5)**Q. 6.** a. What do you mean by target recognition? Explain the method involved in target recognition.**(7.5)**

b. Discuss EDGE technology in detail.

(7.5)**Q. 7.** a. Discuss Global Positioning System in detail.**(7.5)**

b. Discuss MTI RADAR systems in detail.

(7.5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JANUARY-2018
PROGRAM : DIPLOMA(ECE/EE) FIFTH SEMESTER

COURSE CODE : DECT 303/DEET303

COURSE TITLE : CONTROL SYSTEMS

[Time allotted: Three hours]

[Max. Marks: 100]

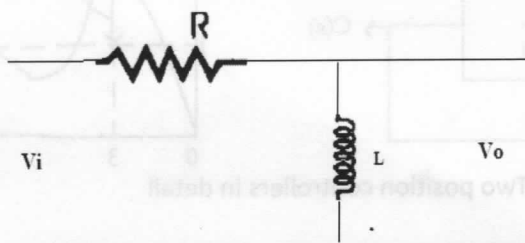
Note: Attempt all Sections & Questions.

Section (A)

Q. 1. Attempt all questions.

(2 x 10 = 20)

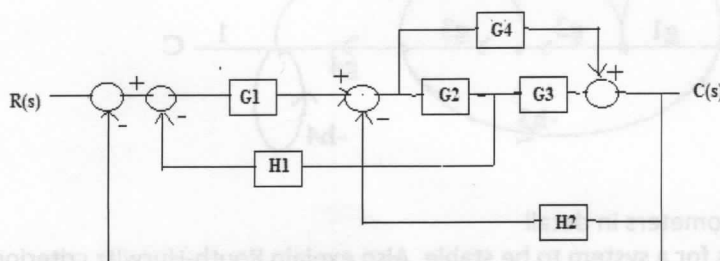
- Find the natural frequency if system has closed loop poles at -3 & -6?
- Discuss transient and steady state response?
- What are MIMO systems? Give suitable examples.
- Discuss in brief about PD controllers.
- Discuss ramp and unit step signal. Also give their Laplace transformation.
- What is a signal flow graph? Explain loop & forward path.
- Discuss the response when system has complex conjugate roots on right half of s-plane.
- What do you mean by peak time of a response? How does settling time effects system performance?
- Discuss the condition required for a LTI system to be stable.
- For the circuit given below find the transfer function

**Section (B)**

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Find $C(s)/R(s)$ using block diagram technique for the fig. given below.



- Discuss static error coefficients. Also find the steady state errors & coefficients for the given data

$$G(s) = \frac{1}{s^2 + s + 2} \quad H(s) = \frac{1}{s + 1}$$

- Find the stability of the system having characteristic equation given below. Also discuss the locations of roots

$$s^5 - 2s^4 + 3s^3 - 6s^2 + 2s - 4$$

- With the help of a block diagram, explain the working of a bathroom tank controller.
- What are servomotors? Explain the construction and working of Ac servomotors.
- Differentiate between open & closed Loop control systems. Also discuss the requirements of a good control system?
- Using Routh Hurwitz criterion find the value of K. Also calculate the frequency of oscillation if the system is marginally stable. Given characteristic eq. is $s^4 + 20s^3 + 15s^2 + 2s + k$

Section (C)

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3. a. What is a control system? With the help of a block diagram explain : Plant, Controller, Control signal & disturbance. (7)

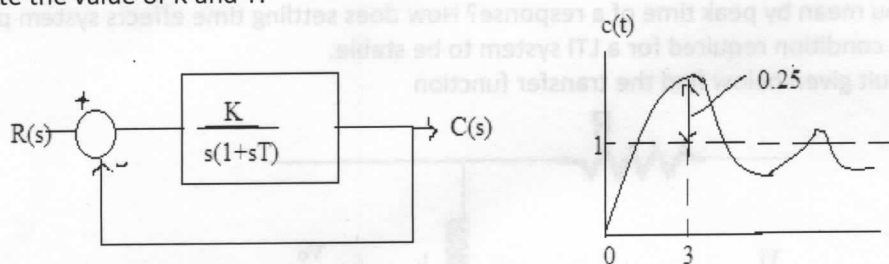
- b. Draw root locus for the unity feedback system with open loop transfer function (8)

$$G(s) = \frac{K}{s(s+4)(s+5)}$$

- Q. 4. a. Explain lead and lag compensator in detail. (7)

- b. With the help of suitable graph, explain delay time, Rise time, max overshoot & settling time. (8)

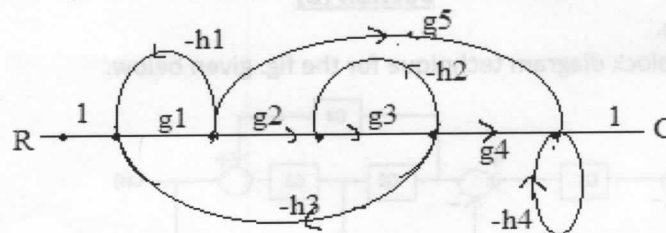
- Q. 5. a. The system shown below when subjected to unit step response shows following output Calculate the value of K and T. (8)



- b. What are controllers? Discuss Two position controllers in detail (7)

- Q. 6. a. What is a root locus? Why it is used? What are centroids & breakaway points on root locus? (7)

- b. For the given SFG find gain of forward path, individual loop gain & gain of 2 non-touching loop. (8)



- Q. 7. a. Discuss working of potentiometers in detail

- b. Write necessary conditions for a system to be stable. Also explain Routh-Hurwitz criterion (8)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM : DIPLOMA(E.E) FIFTH SEMESTER

COURSE CODE : DEET307**COURSE TITLE : PROTECTION AND SWITCHGEAR SYSTEMS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. What are the functions of protective relays?
- b. What is primary protection?
- c. Define operating time of a relay.
- d. What are over and under current relays??
- e. What are the uses of Buchholz's relay??
- f. What is the backup protection available for an alternator?
- g. What are faults associated with an alternator?
- h. What are the main safety devices available with transformer?
- i. Why busbar protection is needed?
- j. What are the characteristic of SF₆ gas?

Section (B)**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Gives them the classification of protective Relay as comparators.
- b. Gives them the classification of protective schemes.
- c. What is the current limiting reactors explain their types and the location of reactors?
- d. What is the grounding and neutral grounding explain?
- e. What is the overcurrent protective schemes and explain their types?
- f. What is auto reclosing explain their types?
- g. What is the wire pilot protection explain their scheme?

Section (C)

Attempt any 3 questions.

(15 x 3 = 45)**Q. 3.** Write short notes on the following.

- a. Klydonograph and magnetic link
- b. Rod gap and Arcing horns

(7.5)**(7.5)****Q. 4.** Describe the following for reverse power or directional relay:

- a. Operating principle
- b. Constructional features and area of applications

(7.5)**(7.5)****Q. 5.** Explain with sketches and their R-X diagrams the following distance relays:**(15)**

- a. Impedance relay
- b. Mho relay
- c. Reactance relay

Q. 6. a. What is the oil circuit breaker? Explain with neat sketch.**(7.5)**

- b. Explain the types of oil circuit breaker.

(7.5)**Q. 7.** a. What are the protections against travelling waves? Explain with neat sketches.**(7.5)**

- b. Explain the types of surge diverter.

(7.5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM : DIPLOMA (EE) FIFTH SEMESTER

COURSE CODE : DEET308**COURSE TITLE : INSTALLATION AND MAINTENANCE****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)****Q. 1.** Attempt **all** questions.**(2 x 10 = 20)**

- a. Write the full form of: PPE and NIOSH.
- b. When do we use CPR?
- c. Write any 2 features of AAC.
- d. What is a Standby meter?
- e. Discuss the role of Foundation in plinth mounted substation.
- f. What is Filtration process in maintenance of transformer?
- g. What do you mean by service mains?
- h. Mention any 2 disadvantages of Breakdown maintenance.
- i. Write down any 4 advantages of distribution transformer over power transformer.
- j. Give any 4 defects occurring in various switches.

Section (B)**Q. 2.** Attempt **any 5** questions.**(7 x 5 = 35)**

- a. Discuss the following: (i) Burns and (ii) Steps if casualty is breathing normally after getting shock.
- b. Explain the following: (i) Clearance of overhead line and (ii) Overhead line crossing.
- c. Write down the major points related to internal inspection of a transformer.
- d. What is Breakdown maintenance? Explain it and give at least 6 disadvantages.
- e. Discuss features of insulating oil used in transformer. What are the range of measured insulation resistance values for (i) healthy transformer oil and (ii) dirty transformer oil? Write the points in a transformer between which insulation resistance is measured.
- f. Explain the following: (i) NEPA, (ii) OSHA and (iii) PPE fact sheet.
- g. Give any 10 requirements for good preventive maintenance.

Section (C)Attempt **any 3** questions.**(15 x 3 = 45)**

- Q. 3.**
 - a. Explain the dangers associated with electrical work. Discuss any 5 tools with proper diagrams which are in electrical installation and maintenance work. (7.5)
 - b. What do you mean by Electrocution? Write down any 10 reasons of electrocution of a person. (7.5)
- Q. 4.**
 - a. What are the important points of: (i) Crossing of Communication lines and (ii) Guarding while crossing of railway line? (7.5)
 - b. Discuss the main points associated with use of insulators and anti-climbing devices. Show the various arrangements of insulator on overhead lines with help of diagrams. (7.5)
- Q. 5.**
 - a. Write down the important points for: (i) Inspection under service interruption and (ii) Steps taken after inspection. (7.5)
 - b. What is the use of CT in a sub-station? Discuss the construction of CT and explain its working with help of neat diagrams. (7.5)
- Q. 6.**
 - a. Give major points of preventive maintenance of : (i) Hot transmission line and (ii) Earthing system (7.5)
 - b. Define Maintenance. Explain the types of maintenance in a brief manner. Which maintenance is mostly used in industries and why? (7.5)
- Q. 7.**
 - a. Explain the measurement of insulation resistance in domestic wiring between Earth and conductor with help of neat diagram. (7.5)
 - b. What do you mean by earth resistance? Discuss earth resistance features in detail. (7.5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JANUARY-2018
PROGRAM: POLYTECHNIC (EE) FIFTH SEMESTER

COURSE CODE : DEET304**COURSE TITLE : POWER ELECTRONICS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**Section (A)****(2 x 10 = 20)****Q. 1.** Attempt all questions.

- a. Explain the reverse break-over voltage of SCR.
- b. Which is most popular method to turn off the Thyristor.
- c. What is key difference in GTO and RCT.
- d. What is difference between TRIAC and DIAC.
- e. How many controlled switches may are used in half controlled bridge rectifier.
- f. What is the use of freewheeling Diode in rectifier.
- g. What are two main type of choppers.
- h. What is duty cycle of a chopper.
- i. What is the use of PWM in Uninterrupted power supply.
- j. What is key purpose of a bridge inverter circuit.

Section (B)**(7 x 5 = 35)****Q. 2.** Attempt any 5 questions.

- a. Explain forward conduction mode of thyristor with help of diagram.
- b. Draw and explain V-I characteristics of SCR. Explain forward and reverse break over voltage.
- c. Draw construction diagram of Power MOSFET and explain its working.
- d. Explain the construction and operation of LASCR with emphasis on trigger adjust.
- e. Explain working principle and circuit diagram of Type B chopper..
- f. A 230V, 50 Hz, supply is connected across single phase half wave rectifier
Calculate the average voltage(V_0) across the load for firing angle 30° .
- g. Explain the function of single phase parallel inverters.

Section (C)**(15 x 3 = 45)**

Attempt any 3 questions.

- Q. 3.**
 - a. Explain reverse/forward blocking mode of SCR with help of diagram (7.5)
 - b. Explain one commutation method of thyristor with help of diagram. (7.5)
- Q. 4.**
 - a. Explain working of transistor as amplifier, also explain function of Darlington pair. (7.5)
 - b. Explain Gate Turnoff Thyristor and discuss its working with help of construction diagram. (7.5)
- Q. 5.**
 - a. Draw circuit diagram of mid-point diode rectifier and explain the working principle. (7.5)
 - b. Draw circuit diagram of three phase fully controlled rectifier and explain the function. (7.5)
- Q. 6.**
 - a. What is the function of a step-up chopper, Explain with help of circuit diagram. (7.5)
 - b. A type A chopper has DC source voltage of 200 volts, the duty cycle of the chopper is 0.4. Calculate: (7.5)
 - i. Average output Voltage
 - ii. Output RMS voltage
- Q. 7.**
 - a. Explain sinusoidal pulse width modulation technique used in inverters. (7.5)
 - b. Explain resonant power supply and draw circuit diagram of series resonant power supply. (7.5)

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Enrol. No. S R H U

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END SEMESTER EXAMINATIONS, JUNE - 2018

PROGRAM: POLYTECHNIC (EE/ECE)

SECOND SEMESTER

COURSE CODE : DEET104

COURSE TITLE : BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

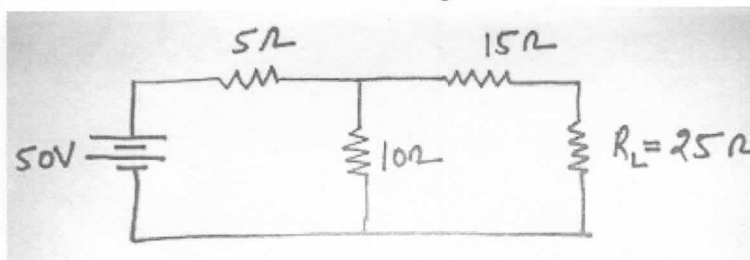
- What is magnetomotive force?
- Explain OHM's law with formula.
- Write the resistance of metallic conductor with formula.
- What is electrical energy with formula?
- What is the advantage of three phase system?
- What is poly phase system?
- What is equivalent resistance of three parallel resistance of $90\text{k}\Omega$?
- If a resistor is to dissipate energy at the rate of 250 W find its resistance for a terminal voltage of 100V .
- What is resonance circuit? What element do we use in resonance circuit?
- What is the current divider rule when two $R\ \Omega$ resistor connected in parallel?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- What is loudspeaker explain their different type?
- Find the current in load resistance in given circuit by the Thevenin's theorem.



- Write the classification of resistor and inductors with proper diagrams.
- Measurement of power and power factor of a balanced three phase load.
- What is fuse? How many types of fuse explain their types with the diagram?
- Explain the formation of PN junction diode with proper diagram.
- Explain the half wave and full wave rectifier with proper diagram.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Explain and draw the neat sketch diagram of common base configuration of transistor, also draw i/p and o/p characteristics of transistor. (7.5)
 - Describe the formation and properties of BJT. (7.5)
- Derive the formula for following:
 - Star to Delta (7.5)
 - Delta to Star (7.5)

Q. 5. Derive the expression for:

- RLC series resonance circuit.
- RLC parallel resonance circuit.
- Q factor of resonating circuit.

Q. 6. Answer the following:

- What is the connector? And what is the use of connector explain? And explain all the types of connector. (6)
- What is the PCB and why we use the PCB in electronic circuit and explain all the type of PCB's? (6)
- Write the steps to preparation of PCB's. (3)

Q. 7. Answer the following:

- What is the thermistor and sensistor explain with diagram. (4)
- What is fuse explain the constructional details of fuse with diagram and the rating of the fuse? (8)
- Derive the formula for reluctance. (3)



SECTION C

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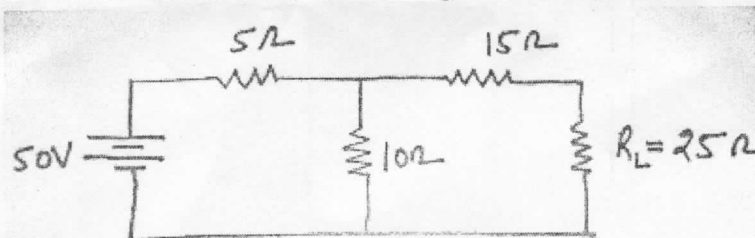
END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM: POLYTECHNIC (EE/ECE) SECOND SEMESTER

COURSE CODE : DEET104**COURSE TITLE : BASIC ELECTRICAL AND ELECTRONICS ENGINEERING****[Time allotted: Three hours]****[Max. Marks]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10)**

- a. What is magneto motive force?
- b. Explain OHM's law with formula.
- c. Write the resistance of metallic conductor with formula.
- d. What is electrical energy with formula?
- e. What is the advantage of three phase system?
- f. What is poly phase system?
- g. What is equivalent resistance of three parallel resistance of $90k\Omega$?
- h. If a resistor is to dissipate energy at the rate of 250 W find its resistance for a terminal voltage of 100V.
- i. What is resonance circuit? What element do we use in resonance circuit?
- j. What is the current divider rule when two $R \Omega$ resistor connected in parallel?

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5)**

- a. What is loudspeaker explain their different type?
- b. Find the current in load resistance in given circuit by the Thevenin's theorem.



- c. Write the classification of resistor and inductors with proper diagrams.
- d. Measurement of power and power factor of a balanced three phase load.
- e. What is fuse? How many types of fuse explain their types with the diagram?
- f. Explain the formation of PN junction diode with proper diagram.
- g. Explain the half wave and full wave rectifier with proper diagram.

SECTION C

Attempt any 3 questions.

(15 x 1)

- Q. 3.
 - a. Explain and draw the neat sketch diagram of common base configuration of transistor, also draw i/p and o/p characteristics of transistor.
 - b. Describe the formation and properties of BJT.
- Q. 4. Derive the formula for following:
 - a. Star to Delta
 - b. Delta to Star

Q. 5. Derive the expression for:

- RLC series resonance circuit.
- RLC parallel resonance circuit.
- Q factor of resonating circuit.

Q. 6. Answer the following:

- What is the connector? And what is the use of connector explain? And explain all the types of connector.
- What is the PCB and why we use the PCB in electronic circuit and explain all the type of PCB's?
- Write the steps to preparation of PCB's.

Q. 7. Answer the following:

- What is the thermistor and sensistor explain with diagram.
- What is fuse explain the constructional details of fuse with diagram and the rating of the fuse?
- Derive the formula for reluctance.



Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : POLYTECHNIC (EE)

THIRD SEMESTER

COURSE CODE : DEET201

COURSE TITLE : CIRCUIT THEORY

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- Define inductance.
- Explain the current division rule.
- Write the formulae used for rectangular to polar conversion.
- Write the well-defined formula for inductive reactance.
- Define resonant frequency.
- Find the value of form factor for ac.
- Define balanced load for three phase loads.
- If phase current for delta connected load is 50A, find line current.
- How can we represent L in frequency domain?
- Find the Laplace transformation for a dc voltage source of 200V.

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- A point charge of $+10^{-7}$ C is situated at the center of a cube of side 1m. Calculate the electric flux through the surface of the cube.
- Derive the expression for Half Power Frequencies of an RLC series circuit.
- Derive the expression for average value of ac.
- Explain the basic concepts for a star connection.
- Derive the expression for voltage across an RL series circuit in frequency domain.
- Derive the expression for Q – factor of an RLC series circuit.
- Show that voltage and current are in phase with each other for ac applied across pure resistor.

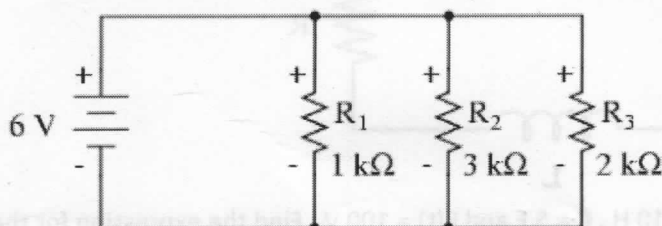
SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

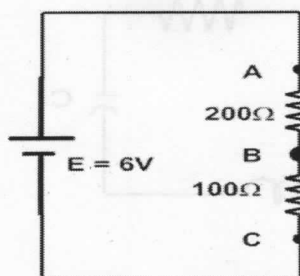
Q. 3. a. Find the current through each resistor using current division rule.

(7.5)

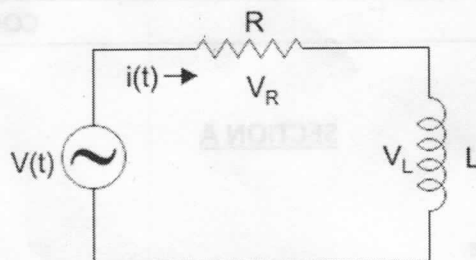


b. Find the voltage across each resistor using voltage division rule.

(7.5)



- Q. 4. a. For $R = 5 \Omega$, $L = 10 \text{ mH}$ and $V = 100\text{V}$, 50Hz ; Find (i) impedance (ii) current (iii) power factor (iv) power consumed. (7.5)



- b. Derive the expression for impedance for RLC series circuit using phasor diagram. (7.5)

- Q. 5. a. Derive the expression for three phase power using two wattmeter method. (7.5)

- b. An RLC series circuit consists of $R = 1000 \Omega$, $L = 100 \text{ mH}$, $C = 10 \mu\text{F}$. If the voltage of 100 V is applied across the combination, find the following: (7.5)

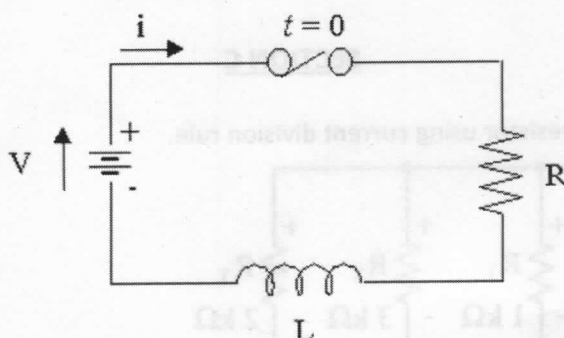
- i. resonant frequency
- ii. Q-factor
- iii. half power points

- Q. 6. a. Show that for a three phase delta connected balanced load line current is $\sqrt{3}$ times the phase current. (7.5)

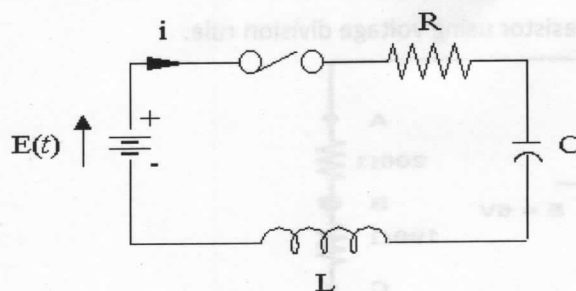
- b. A balanced three phase, delta connected load has per phase impedance of $(15+j40)\Omega$. If 440V , three phase supply is connected to this load, find : (7.5)

- i. Phase current
- ii. Line current
- iii. Power factor
- iv. Power supplied to the load

- Q. 7. a. For the given circuit $R = 30 \Omega$, $L = 15 \text{ H}$ and $V = 60 \text{ V}$; Find the expression for the current. (7.5)



- b. For the given circuit $R = 2 \Omega$, $L = 10 \text{ H}$, $C = 5 \text{ F}$ and $E(t) = 100 \text{ V}$; Find the expression for the current. (7.5)



Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE-2018

PROGRAM: POLYTECHNIC (ECE)

FOURTH SEMESTER

COURSE CODE : DECT210

COURSE TITLE : ELECTRONIC MEASUREMENTS

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- What are directional couplers? Why are they used?
- With the help of examples discuss active and passive instruments.
- Why is impedance matching necessary?
- Differentiate between random error and systematic error.
- Differentiate between dual trace and dual beam oscilloscope.
- What is an instrument? Discuss the conditions necessary for a result to be meaningful.
- Differentiate between analog and digital multimeter.
- What do you mean by null type instruments?
- Discuss Barkhausen criterion. Where is it used?
- What is an instrumental error? How can it be avoided?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Discuss working principle of dual trace oscilloscope.
- What are transmission lines? Derive an expression for the power delivered to load.
- What are Lissajous patterns? Why are they used? Discuss in detail.
- What is a Q meter? Why is it used? Discuss direct connection type Q meter in detail.
- Explain the working of digital LCR meter in detail.
- What is an oscillator? Discuss its working principle. Draw the circuit diagram of RC phase shift oscillator and write an expression for its gain.
- Discuss Hartley oscillator in detail.

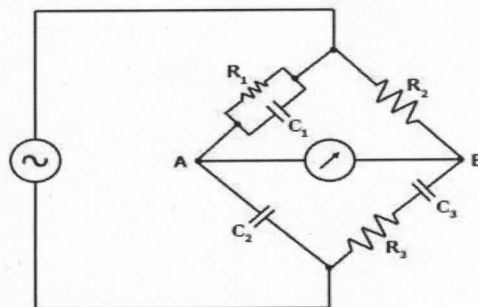
SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

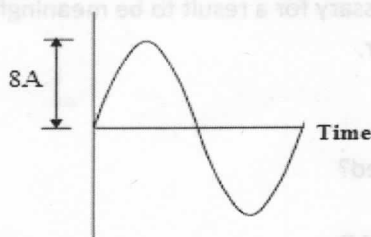
- Q. 3. a. Explain the working principle of a differential voltmeter (7.5)
b. Explain the building blocks of a basic CRO. (7.5)

- Q. 4. a. A Schering bridge has following constant: $R_1=1.2\text{ K}\Omega$, $C_1=0.45\text{ }\mu\text{F}$, $R_2=2.1\text{ K}\Omega$, $C_2=0.6\text{ }\mu\text{F}$. (7.5)
If frequency of operation is 2 KHz, find unknown capacitance and dissipation factor.

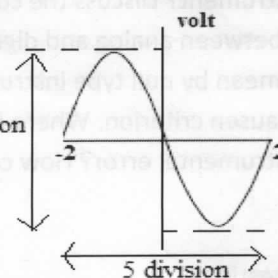


- b. What are the disadvantages of an analog oscilloscope? Discuss DSO in detail. (7.5)

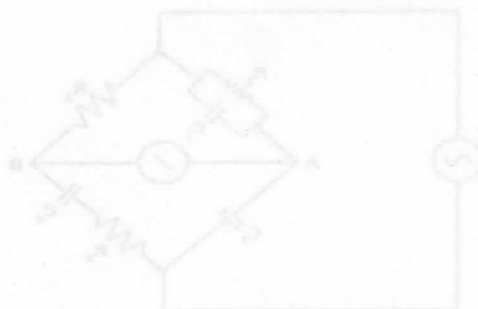
- Q. 5.** a. Explain the construction and working of a Wheatstone bridge in detail. (7.5)
b. Discuss digital frequency meter in detail. (7.5)
- Q. 6.** a. What are deflection type instruments? Discuss construction & working of PMMC instruments. (7.5)
b. Why is a bolometer used? With the help of suitable diagram discuss its working. (7.5)
- Q. 7.** a. With the help of block diagram explain the working of function generators. (7.5)
b. For fig (a) given below, if vertical attenuation is 4v/div find the peak to peak amplitude & rms value. (7.5)
For fig (b) given below, if vertical attenuation is set to 0.8v/div, find peak to peak amplitude.
Also find the frequency if time/div is set to 4μs/div.



(a)



(b)



Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE-2018
PROGRAM: POLYTECHNIC (BME) FOURTH SEMESTER

COURSE CODE : DBMT210**COURSE TITLE : MEASUREMENTS AND TEST EQUIPMENTS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Explain the term sensitivity and resolution of digital instruments.
- b. Give classification of performance characteristics.
- c. What do you mean delay line in CRO?
- d. Explain how to calibrate analog ohm meter.
- e. Draw the circuit for Schering Bridge.
- f. Explain zero adjustment in PMMC.
- g. Explain the working principle logic probe.
- h. Explain the analog and digital signal.
- i. Define AF and RF oscillators.
- j. Explain why crystal oscillators are better than RC, LC oscillators.

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. With suitable diagram explain multi range DC- voltmeter circuit.
- b. For following given data: $x_1=49.7$, $x_2= 51.4$, $x_3=44.8$, $x_4=48.5$, $x_5=46.89$.
Calculate (i) Arithmetic mean, (ii) Deviation of each value & (iii) Algebraic sum of the deviations.
- c. Explain electronic voltmeter and its advantages.
- d. Given meter resistance 50 Ohm, calculate series resistance for 0-50 volt range voltmeter.
- e. Draw the circuit of Wheatstone bridge and derive the necessary formula.
- f. Explain pH meter with a block diagram.
- g. Explain ohm meter and explain the procedure to find out the unknown resistance value.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.**
 - a. Draw the functional block diagram of dual beam CRO and explain it. (7.5)
 - b. Explain with suitable circuit diagram the working of digital tachometer. (7.5)
- Q. 4.**
 - a. Draw the block diagram of Pulse Generator and explain it. (7.5)
 - b. Compare Digital Instruments and Analog Instruments. (7.5)
- Q. 5.**
 - a. Compare Maxwell's bridge and Hey bridge with suitable diagram. (7.5)
 - b. Write a brief note on IC tester. (7.5)
- Q. 6.**
 - a. With suitable diagram explain AF oscillators. (7.5)
 - b. A volt meter having sensitivity 1 kohm/V is connected across an unknown resistance in series with a multimeter reading 80mV On 150 V scale. When the multimeter reads 10 mA, calculate: (7.5)
 - i. Apparent resistance of the unknown resistance
 - ii. Actual resistance of unknown resistance
 - iii. error due to loading effect of the volt meter
- Q. 7.**
 - a. Explain different controls on front panel of CRO and their functions. (7.5)
 - b. Explain curve tracer. (7.5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM : POLYTECHNIC (BME) FOURTH SEMESTER

COURSE CODE : DBMT209**COURSE TITLE : ANALYTICAL BIOINSTRUMENTATION****[Time allotted: Three hours]****[Max. Marks : 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. What is constructive interference?
- b. State Beer Lambert's law.
- c. What is chromatography?
- d. Define retention time.
- e. Define capacity factor.
- f. Draw the theoretical plate model of chromatography.
- g. Enlist the types of liquid chromatography.
- h. What are the benefits of automation?
- i. What is conductivity?
- j. Define pH.

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Draw and explain the block diagram of biomedical instrumentation system.
- b. What are optical filters? Explain their types.
- c. What is colorimeter? Enlist and explain the components in a colorimeter.
- d. What is a flame photometer? Explain the method of detection in a flame photometer.
- e. What is gas chromatography? Explain the basic parts of a gas chromatograph in detail.
- f. Explain HPLC in detail.
- g. Draw and explain the continuous flow system in an automated biochemical analysis system.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.** a. What are monochromators? Explain the working of prism and diffraction gratings in detail. (9)
b. What are holographic gratings? Explain their fabrication process. (6)
- Q. 4.** a. Explain in detail the working of a multichannel colorimeter. (7)
b. Explain Biosensors. (8)
- Q. 5.** a. Draw and explain in detail the schematic diagram of a flame photometer. (10)
b. What does the emission system consist of? (5)
- Q. 6.** a. Explain the arrangement for injecting solid, liquid and gas samples in a chromatograph. (8)
b. State the principle of working of electrophoresis. What is moving boundary method? (7)
- Q. 7.** a. What is a chromatographic column? Explain its types and differentiate between the two. (8)
b. Explain single and double beam type densitometers. (7)

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END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM : POLYTECHNIC (ECE) FOURTH SEMESTER

COURSE CODE : DECT208**COURSE TITLE : COMMUNICATION SYSTEMS - II****[Time allotted: Three hours]****[Max. Marks : 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.**(2 x 10 = 20)**

- a. What are the advantages of digital communication system?
- b. What is the relationship between transmission bandwidth and number of bits in PCM?
- c. What are the different types of modem used in telephone communication?
- d. What is the function of switching in telephone network?
- e. Write the full form of: (i) TDMA/FDD (ii) FDMA/FDD
- f. What is the difference between simplex and duplex communication?
- g. What is the relationship between antenna efficiency and antenna resistance?
- h. Draw the diagram of waveform of FSK and PSK.
- i. What are the advantages of spread spectrum technique?
- j. Define directivity of an antenna.

SECTION B

Q. 2. Attempt any 5 questions.**(7 x 5 = 35)**

- a. Define pulse modulation techniques: (i) PAM (ii) PWM, with diagrams.
- b. Why time division multiplexing is prefer over frequency division multiplexing? Explain briefly.
- c. Explain PSK and its demodulation using coherent detector.
- d. Explain log periodic antenna with diagram.
- e. Describe the various factors that decide the optimum length of grounded medium frequency antenna.
- f. How are pseudo codes generated in code division multiple access? Explain its advantages.
- g. Explain architectural principles of combined telephone networks.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.**
 - a. Describe the generation of pulse code modulation (PCM) with block diagram. Also explain its limitation? (7.5)
 - b. What is the role of Frequency shift key in communication? Explain its generation and detection method. (7.5)
- Q. 4.**
 - a. What do you mean by multiple access technique? Explain different type of multiple access techniques used in communication. (7.5)
 - b. Define spread spectrum technique. Explain different type of spread spectrum techniques (7.5)
- Q. 5.**
 - a. What do you mean by modem? Explain its role in telephone network. Also explain different type of modems used in communication. (7.5)
 - b. Explain the working of public switching telephone network. How is switching performed in PSTN? (7.5)
- Q. 6.**
 - a. What is horn antenna? How it is fed? What are its applications? (7.5)
 - b. Explain the operation of Yagi Uda array. List its applications. Why is it called super gain antenna? (7.5)
- Q. 7.**
 - a. Describe gain of an antenna. What part does the isotropic antenna play in its calculation? How is the isotropic radiator define? (7.5)
 - b. Describe the end fire array and its radiation pattern and explain how the pattern can be made unidirectional? (7.5)

Enrol. No. S R H U

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END SEMESTER EXAMINATIONS, JUNE-2018

PROGRAM : POLYTECHNIC (BME)

FOURTH SEMESTER

COURSE CODE : DBMT211

COURSE TITLE : BIOMEDICAL EQUIPMENT

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections and Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- a. State the difference between Electroencephalograph and Electroencephalogram.
- b. What does ECG stand for?
- c. Draw a typical ECG waveform.
- d. Write full forms of AV and SA node.
- e. State the pressure values in venous system.
- f. What is the frequency range of alpha wave in EEG?
- g. What does PCG stand for?
- h. What is bradycardia?
- i. What are the systolic and diastolic values of blood pressure?
- j. State the four heart valves.

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- a. Enlist special types of ECG recorders. Explain Holter monitoring in detail.
- b. Explain the Korotkoff method for blood pressure monitoring.
- c. Enlist the methods for measurement of respiration rate. Explain CO₂ method in detail.
- d. Draw the block diagram of EEG machine.
- e. Write a short note on EMG.
- f. What is the need for a defibrillator?
- g. Which types of microphone are used in PCG?

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.
 - a. What are the effects of artifacts on ECG recordings? (5)
 - b. State Einthoven postulate. Draw the circuit diagrams for ECG recording using leads. (10)
- Q. 4.
 - a. What is a plethysmograph? Explain the photoelectric method for measurement of pulse rate. Draw and explain the block diagram for processing plethysmographic signals. (10)
 - b. Explain differential auscultatory technique for indirect blood pressure measurement. (7)
- Q. 5.
 - a. Explain the origin of heart sounds. (8)
 - b. What is the need for a pacemaker? Differentiate between internal and external pacemakers. (7)
- Q. 6.
 - a. Explain the five letter classification code for pacemaker. (8)
 - b. Explain the power supplies used in pacemakers.
- Q. 7.
 - a. Explain the working of DC defibrillator. What is the need for synchronizer? (9)
 - b. Write a short note on implantable defibrillator. (6)

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Enrol. No. S R H U

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END SEMESTER EXAMINATIONS, JUNE-2018

PROGRAM : POLYTECHNIC (ECE)

FOURTH SEMESTER

COURSE CODE : DECT211

COURSE TITLE : AUDIO & VIDEO SYSTEMS

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections and Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- a. Expand the following abbreviations: PAL, NTSC & SECAM.
- b. How SNR affects the fidelity of the system? Explain.
- c. Discuss the frequencies used for the transmission and reception of TV signals.
- d. What do you mean by Front and Back porch?
- e. Explain the following terms: Pixels, frames & Aspect ratio.
- f. Which antenna is mostly used for TV transmission and reception and why?
- g. What are TV standards? Why different countries use different standards?
- h. Explain photoconductivity and photo emission.
- i. What do you mean by a transponder?
- j. How sound waves are produced? Define amplitude and frequency of a sound?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- a. Explain the construction and working of image orthicon in detail.
- b. With the help of block diagram explain transmission and reception of TV signal via earth station.
- c. Discuss stereophony and monophony in detail.
- d. With the help of sideband spectrum, explain why VSB is preferred over SSB and DSB for modulating a TV signal.
- e. What is a composite signal? Discuss its various components.
- f. Why data encoding, data compression and data encryption is done before transmitting a TV signal? Explain.
- g. Explain NTSC in detail.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3. a. With the help of block diagram explain transmitter of Monochrome Television in detail. (7.5)
- b. Explain the principle of color picture tube. Discuss delta gun color tube in detail (7.5)
- Q. 4. a. Discuss cable TV system in detail. (7.5)
- b. With the help of block diagram, explain the receiver of a monochrome TV in detail. (7.5)
- Q. 5. a. Explain construction and working of a Vidicon camera tube in detail. (7.5)
- b. Explain how data is recorded in a disc? (7.5)
- Q. 6. a. Explain degaussing circuit in details (7.5)
- b. Explain the working of remote control in detail. (7.5)
- Q. 7. a. Explain the construction and working of color TV camera in detail. (7.5)
- b. Explain how the data is reproduced in a CD player. (7.5)

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END SEMESTER EXAMINATIONS, JUNE - 2018**PROGRAM : POLYTECHNIC (ECE / BME)****FOURTH SEMESTER****COURSE CODE : DCET207 /DBMT207****COURSE TITLE : ELECTRONIC CIRCUITS - II****[Time allotted: Three hours]****[Max. Marks : 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Describe the term band width.
- b. What is class B amplifier?
- c. What is a non inverting amplifier?
- d. What is a low pass filter? Draw its frequency response.
- e. Discuss non sinusoidal oscillator.
- f. Give the expression for negative feedback amplifier?
- g. Discuss the IC 565.
- h. Discuss collector efficiency.
- i. If 1st stage amplifier gain is 10 db & 2nd stage gain is 20db, find the overall gain of amplifier.
- j. What do you mean by small signal & large signal amplifier?

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. What is the basic difference between voltage amplifier & power amplifier? How is an amplifier different from oscillator? Explain your answer.
- b. Explain complementary-symmetry push pull amplifier. Write its advantages & disadvantages.
- c. Explain negative feedback amplifier. Discuss common collector amplifier. Why is this amplifier used over impedance matching transformer.
- d. What is the basic difference between RC oscillator & LC oscillator? Explain Hartley's oscillator.
- e. What is operational amplifier? Explain all its characteristics.
- f. Explain phase shift oscillator? If $R_1=R_2=R_3=1M\Omega$ and $C_1=C_2=C_3=C=1\mu F$, find oscillator frequency.
- g. Explain 555 as monostable multivibrator.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.**
 - a. With the help of diagram explain the construction and working of Wein bridge oscillator. Why do we need positive as well as negative feedback in this oscillator? **(7.5)**
 - b. Discuss operational amplifier as integrator & differentiator. **(7.5)**
- Q. 4.**
 - a. What do you mean by free running multivibrator? Draw the neat & clean circuit diagram of a stable multivibrator **(7.5)**
 - b. What is comparator? Discuss comparator with working principal and its application. **(7.5)**
- Q. 5.**
 - a. Discuss PLL with its architecture diagram, working principal and application. **(7.5)**
 - b. What is single ended power amplifier? Discuss different advantages of negative feedback amplifier. If voltage gain of amplifier is 1000 and feedback fraction is 0.1 find voltage gain with feed back. **(7.5)**
- Q. 6.**
 - a. Why impedance matching is required? Give the expression for impedance matching. **(7.5)**
 - b. Discuss differential amplifier in detail. Also discuss single ended and common mode operation. **(7.5)**
- Q. 7.**
 - a. What is crystal? Define crystal as oscillator. Give its working principle with circuit diagram. **(7.5)**
 - b. Explain voltage control oscillator with neat & clean block diagram. **(7.5)**

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE-2018
PROGRAM: B.TECH.(ECE / EE) FOURTH SEMESTER

COURSE CODE : CEC207 / CEE209**COURSE TITLE : ELECTRONIC CIRCUIT ANALYSIS - II****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions. Each question carries 2 marks.**(2 x 10 = 20)**

- a. Define overdrive voltage.
- b. What is the input common mode range of MOSDP?
- c. Write the expression for the drain current of MOSDP?
- d. Write any TWO differences between Synchronous & Staggered Tuned Amplifiers?
- e. What is the Miller effect? How to get rid of it?
- f. Give any TWO differences between RC coupled and Transformer coupled Class-A PA.
- g. What is Cross-Over Distortion?
- h. What is Eccles-Jordan circuit? Can it be used as memory?
- i. What is the role of Commutation Capacitors?
- j. Give the expression for the Gate Width of Collector-coupled MMV.

SECTION B

Q. 2. Attempt any 5 questions. Each question carries 7 marks.**(7 x 5 = 35)**

- a. Compare the series and shunt resonance circuits.
- b. Plot the f vs ACM, f vs AD & f vs CMRR curves of MOSDP.
- c. It is required to design a singled tuned amplifier having $f_o=1\text{MHz}$, 3-dB bandwidth=10KHz, and center frequency gain=-10. The FET available has at the bias point $g_m=5\text{mA/V}$ and $r_o=10\text{ K}\Omega$. The output capacitance is negligibly small. Determine the values of R_L , C_L and L ?
- d. How to improve the resolution of the BMV? Explain at least one method in detail.
- e. Describe the operation of Schmitt trigger using pictorial representation.
- f. Explain the operation of Astable multivibrator using neat diagrams.
- g. What is Common Mode Half Circuit? Derive its A_d , ACM & CMRR.

SECTION C

Attempt any 3 questions. Each question carries 15 marks.

(15 x 3 = 45)**Q. 3.**

- a. Derive the expressions for i_{d1} & i_{d2} of MOSDP and plot the transfer characteristics? (7)
- b. What is the effect of g_m & R_D mismatch on CMRR? (8)

Q. 4.

- a. Derive the expression for Common Mode Rejection Ratio of MOSDP. (7)
- b. A coil having an inductance of $10\mu\text{H}$ is intended for applications around 1MHz. Its Q is specified to be 200. Find the equivalent parallel resistance R_p . What is the value of the capacitor required to produce resonance at 1MHz? What additional parallel resistance is required to produce a 3-dB bandwidth of 10 KHz? (8)

Q. 5.

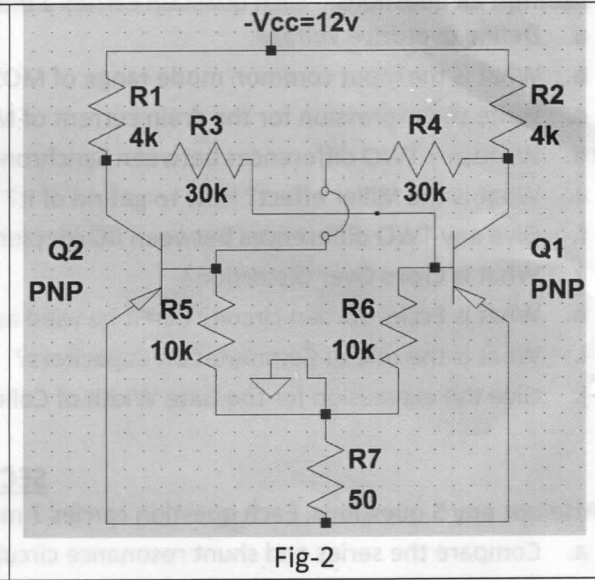
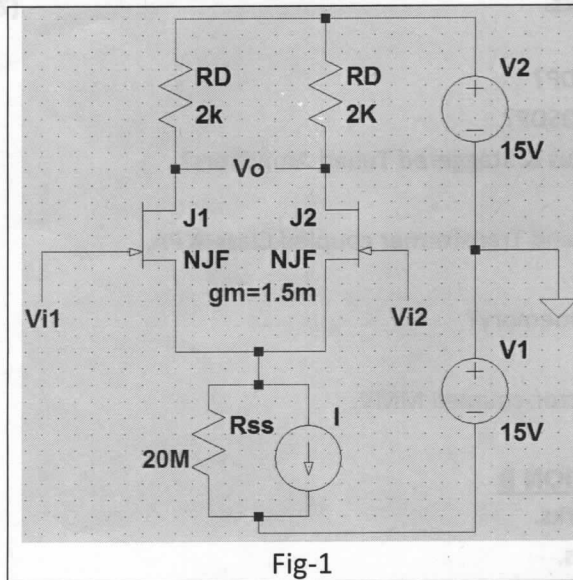
- a. Compare the power conversion efficiency of all the power amplifiers and write advantages and disadvantages of each. (8)
- b. Calculate the A_d , A_{CM} , and CMRR of the circuit shown in the Fig-1. (7)

Q. 6.

- Explain the operation of Class-C Power Amplifier and derive its η . (8)
- A class-B push-pull power amplifier is supplied with $V_{cc}=40V$. The signal brings down to $V_{min}=10V$. The total dissipation from both transistors is 30W. Find P_T and η . (7)

Q. 7.

- Calculate the stable-state currents and voltages of the BMV shown in Fig-2 for $\beta=40$. (8)
- Explain the operation, advantages & disadvantages of Direct Coupled Binary. (7)



SECTION C

Enrol. No.

S R H U

Regn. No.

D D

END SEMESTER EXAMINATION, JUNE-2018

PROGRAM : POLYTECHNIC (ECE / CSE)

FOURTH SEMESTER

COURSE CODE: DECT209 / DCST210

COURSE TITLE : MICROPROCESSORS & PERIPHERAL DEVICES

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- a. What do you mean by 16 bit Microprocessor?
- b. How many interrupt in 8085?
- c. What is ALE signal?
- d. Discuss various types of GPR in 8085.
- e. What is the status signal in 8085?
- f. Discuss SID & SOD in 8085 microprocessor.
- g. What is the NEG in 8086.
- h. Discuss Baud Rate
- i. What is EU & BIU?
- j. What is 8279?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- a. Explain 8085 microprocessor with neat architecture diagram.
- b. What is interrupt in 8085? Describe 8259 with pin configuration.
- c. If code segment address is 0400H and IP address is 0500H Find physical address. Define different segment register.
- d. Explain General purpose programmable peripheral IC With its control word.
- e. If two data 65H and 55H located in memory location 2500H and 2501H. Add this two data and store the result in 2600H.
- f. Describe Volatile & Non Volatile Memory. Make the timing diagram for WR signal.
- g. Discuss various types of addressing Mode in 8085 Explain with Details.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3. a. Why do we require DMA controller. Discuss the DMA control signal. (7.5)
b. How many flag used in 8086 microprocessor? Explain all the flag. (7.5)
- Q. 4. a. What is R-2R net work? If reference voltage is 16v, find out put voltage for digital input 1010. (7.5)
b. Explain 8086 microprocessor with pin configuration. (7.5)
- Q. 5. a. Explain RIM & SIM instruction in 8085 also discuss its control word. (7.5)
b. Explain various types of instruction set in 8085 microprocessor. (7.5)
- Q. 6. a. Discuss various types of timing & control signal in 8085. Also explain BHE & MN/MX mode signal in 8086. (7.5)
b. Discuss the terms: LODSB, XCHG, MOV [SI], 0500H, CMA, NOP, HLT, LDA 2200H (7.5)
- Q. 7. a. Draw the block diagram of interrupt controller. Discuss the hardware & software interrupt with their memory location. (7.5)
b. Discuss the I/O & Bit Set Reset mode in 8255. Give the suitable block diagram of 8255. (7.5)

Enrol. No.

S R H U

Regn. No.

D D

END SEMESTER EXAMINATION, JUNE-2018

PROGRAM : POLYTECHNIC (BME)

FOURTH SEMESTER

COURSE CODE: DBMT 208

COURSE TITLE : MICROPROCESSOR & DIGITAL FUNDAMENTALS

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- Give the basic difference between analog & digital signal.
- What is GPR? How many GPR are used in microprocessor in 8085.
- Discuss Duality Theorem.
- Discuss ASCII code.
- What is 7402? Give the applications of NOR Gate.
- What is the invalid condition in flip flop?
- What do you mean by 8 bit microprocessor?
- What is a buffer register? Discuss it.
- How many Flags are used in 8085.
- Discuss SID & SOD signal.

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Explain microprocessor 8085 with pin configuration.
- What is addressing mode? Define various types of addressing mode.
- Discuss Demorgan's theorem in details. Write the application of EXOR Gate.
- Define various types of flag in 8085 microprocessor.
- What is the Importance of K map. Design full adder logic circuit with the help of K map.
- Simplify the Boolean equation with the help of K map- $f(a,b,c,d) = \sum (m_1, m_3, m_5, m_7, m_9, m_{11}, m_{13}, m_{15})$
- Give the basic difference between DeMux & De coder. Design 2*4 decoder circuit with the help of truth table.

SECTION C

Attempt any three questions.

(15 x 3 = 45)

- Discuss different types of semiconductor memories used in microprocessor. (7.5)
 - Give the basic difference between combinational & sequential logic circuit Discuss D flip flop with proper truth table. (7.5)
- Explain R-S flip flop with working principle & truth table. (7.5)
 - Give the basic difference between Buffer Register & Shift Register. Discuss 3 bit shift register with its timing diagram. (7.5)
- With neat & clean architecture diagram explain 8085 microprocessor. (7.5)
 - What is the Instruction set in 8085. Find the 2's complement of 55H. Write ALP in 8085. (7.5)

Q. 6. a. Convert the following number into:

- i. $(524)_{10} = (?)_2$
- ii. $(AC9)_{16} = (?)_2$
- iii. $(10101)_2 = (?)_{10}$
- iv. $(1011)_2 = (?)_{\text{gray}}$
- v. $(0.625)_{10} = (?)_2$
- vi. $(725)_8 = (?)_2$
- vii. $(265)_{\text{BCD}} = (?)_2$

b. Define following instructions-

- i. MOV A, M
- ii. XOR A
- iii. LXI H 2500H
- iv. MVI B, 66H
- v. ADD B
- vi. MOV C, B

Q. 7. a. What is the timing and status signal in 8085 microprocessor. If two data are 44H & 55 H write a ALP for additions of the two data and store the result in memory location 2500H.

b. Write short notes on -

- i. Hex Code
- ii. Gray Code
- iii. Excess 3 code
- iv. BCD code

SECTION C

Enrol. No.

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END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM : POLYTECHNIC (EE) FOURTH SEMESTER

COURSE CODE : DEET207**COURSE TITLE : ELECTRICAL MACHINES - II****[Time allotted: Three hours]****[Max. Marks : 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.**(2 x 10 = 20)**

- a. What is the application of Induction generator.
- b. Describe slip of an Induction motor.
- c. Explain why Induction motor has high starting current.
- d. What is key benefit of wound rotor induction motor?
- e. State four conditions that should be met before parallel operation of the alternator.
- f. State any two benefits of using cylindrical rotor in synchronous machine.
- g. What is an under excited synchronous machine.
- h. What are V curves of synchronous machine?
- i. What are various types of single phase induction motors?
- j. What are the usage of stepper motors?

SECTION B

Q. 2. Attempt any 5 questions.**(7 x 5 = 35)**

- a. Provide a detailed explanation of torque-slip characteristics of an 3 Φ induction motor with help of diagram. Describe it with value of torque at low and high value of slip.
- b. Draw and explain equivalent circuit of 3 phase induction machine.
- c. Describe direct online (DOL) starting of 3 Φ induction motor with help of circuit diagram.
- d. Draw phasor diagram of loaded generator under inductive, capacitive and unity power factor load.
- e. Explain hunting and damping in synchronous motor.
- f. Draw and explain V curves and inverted V curves of synchronous machine.
- g. Explain construction and operation of universal motor.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.**
 - a. A three phase 50 Hz 6 pole slip ring wound rotor induction motor runs at full load with slip of 2%. Rotor is star connected and its stand still reactance is 0.2 ohm. Rotor resistance is 0.9 Ω . Stand still emf between slip rings is 90 Volts. Calculate:
 - i. Rotor per phase induced emf at full load.
 - ii. Rotor reactance at full load.
 - iii. Rotor current at full load.
 - iv. Rotor current frequency at full load.
 - b. A three phase 50 Hz 24 pole induction motor has standstill emf of 5V at rotor bars. Calculate:
 - i. Rotor slip at a speed of 240 rpm.
 - ii. Speed of rotor at slip of 4%.
 - iii. frequency induced in rotor at a slip of 3%.

- Q. 4. a. Explain power flow equation (P_{gap} , P_{mech} , P_{rotor}) of induction machine with help of block diagram.
b. Describe working of 1 Φ induction motor with the help of two rotating field theory.

What is rotor slip with respect to two rotating fields.

- Q. 5. a. A 3 Φ 8 pole 50 Hz alternator has star connected full pitched winding with 480 conductors per phase. The flux per pole is 0.02 weber/pole. Winding distribution factor $K_d = 0.96$. Calculate per phase EMF generated in alternator.
b. Two 3 Φ alternators X and Y are operating in parallel. The rating of alternator X is 150 MW. The rating of alternator Y is 350 MW. Their frequency regulation is 2% and 4% respectively. Find sharing of a load of 400 MW by alternator X and Y. Calculate system frequency at this load.

- Q. 6. a. Write a detailed comparison between synchronous and induction machine.
b. Describe the effect of changing the field excitation of synchronous motor under constant load.

- Q. 7. a. What is the function of stepper motor. Describe working principle of variable reluctance stepper motor with help of diagram.
b. Describe and explain single phase synchronous motor, its type and operation of reluctance motor.

SECTION B

SECTION C

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE-2018

PROGRAM : POLYTECHNIC (EE)

FOURTH SEMESTER

COURSE CODE : DEET211

COURSE TITLE : ELECTRICAL DRAWING AND ESTIMATION - II

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections and Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- Define the term 'Estimating'.
- What do you mean by overhead charges?
- What is Earthing?
- Name the types of Earthing Systems.
- How can we take single phase connection from three phase supply keeping three phase supply balanced?
- Define a distribution fuse board.
- Draw a diagram showing cross arm.
- Write any 2 differences between transmission and distribution system.
- What is a power wiring in electrical system?
- Discuss the role of a relay in substation.

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Explain the following:
 - Price list with example
 - Contingencies
 - Profit purchase system
- Discuss Step potential and Touch potential with help of a proper diagram.
- Draw the diagram for a three phase 4 wire supply system and explain its features.
- Explain the laying of underground cables in detail.
- What are lightning arrestors? Explain with help of diagram.
- Explain the features of conductors used for overhead transmission lines and write down various accessories used to attach the conductor on poles. Give the function of each accessory.
- Explain the IS specifications related to power wiring. Cover IS 732:1983 and its rules for switch boards in this discussion.

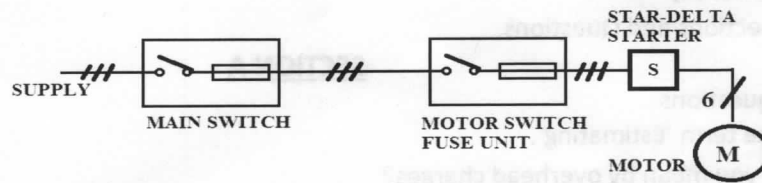
SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3. a. For the given installation plan shown in **single line drawing number 1** (given on last page), perform the following:
- Draw the wiring diagram for the installation shown in single line diagram
 - Show the calculation for total length of wire and batten.
 - Calculate the labour cost (if 1 wireman and 1 helper is used who together can wire 3 points in 1 day. Per day charge of wireman is Rs. 100 and of helper is Rs 70). (7.5)
- b. What is a Sub-circuit in electrical Wiring? How do you calculate the number of sub-circuits, explain with an example? Is this calculation same for Light circuit and Power circuits? (7.5)
- Q. 4. a. Explain the various IS specifications regarding earthing of installations. (7.5)
- b. What are TT system of earthing and IT system of earthing? Explain with proper diagrams. (7.5)

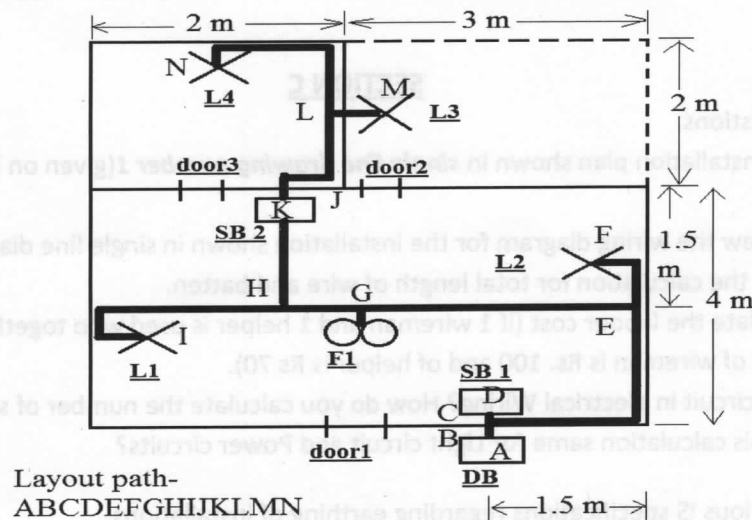
- Q. 5.** a. Write down differences between light and power wiring. Discuss single phase supply system with help of labeled diagram. (7.5)
- b. For given single line diagram of three phase AC motor of 15 HP, 415 Volts, 0.8 power factor, 85% efficiency; answer the following: (7.5)



- i. Calculate the full load current of motor and obtain suitable cable size from **Table 1**.
- ii. Draw complete wiring diagram for the single line diagram shown above.
- iii. Find out rating of switch fuse unit and select suitable one from **Table 2**.
- Q. 6.** a. Explain stays (Guys) and their types in detail with help of neat labeled diagrams. (7.5)
- b. Why guarding wires are installed? Discuss the types of guarding with help of labelled diagrams. (7.5)
- Q. 7.** a. What is a substation? How many types of substation can be there? Discuss the earthing of a pole mounted substation with help of a diagram. (7.5)
- b. Explain the following: (7.5)
- Power transformer
 - Circuit breakers
 - Isolator used in substation

TABLE 1		
Size of conductor		Current Rating (Amperes)
Nominal Area (mm ²)	Number and Diameter of wire (mm)	
6	1 / 2.28	27
10	1 / 3.55	34
16	7 / 1.70	43
25	7 / 2.24	59

TABLE 2	
Switch Fuse Unit Name	Rating (Amperes)
TPIC Switch 1	15
TPIC Switch 2	30
TPIC Switch 3	60
TPIC Switch 4	100



Single line drawing number 1

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END SEMESTER EXAMINATIONS, JUNE-2018
PROGRAM: POLYTECHNIC (EE) FOURTH SEMESTER

COURSE CODE : DEET208**COURSE TITLE : ELECTRICAL INSTRUMENTATION****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.**(2 x 10 = 20)**

- a. An intelligent information system used for the measurement of a physical quantity is _____.
- b. In an a.c. circuit, the connection of measuring instrument causes loading error which may affect _____.
- c. The power can be controlled in a circuit by _____.
- d. A meter reads 151.75 v, and the true value of the voltage is 152.9 v. Determine static error and the static correction for this instrument.
- e. A 0-10 A ammeter has a guaranteed accuracy of 1% of full deflection. The limiting error while reading 2.5A is _____.
- f. Swamping resistance is connected as _____.
- g. A 1 mA ammeter has a resistance of 100 ohm. It is converted to a 1A ammeter. The value of shunt resistance is _____.
- h. The high torque to weight ratio in an analog indicating instrument indicates _____.
- i. A moving iron instrument which can be used for current and voltage measurement is _____.
- j. An energy meter is designed to make 100 revolutions of disc for one unit of energy. Calculate the number of revolutions made by it when connected to load carrying 40A at 230v and 0.4 power factor for an hour. If it actually makes 360 revolutions, find the percentage error.

SECTION B

Q. 2. Attempt any 5 questions.**(7 x 5 = 35)**

- a. Draw the circuit of Kelvin's double bridge used for measurement of low resistance. Derive the condition for balance.
- b. Describe the construction and working of an earth tester. Explain how it can be used for measurement of resistance of an electrode.
- c. Discuss the constructional detail of a thermocouple type instrument used at very high frequencies. Describe the advantages and disadvantages.
- d. Explain the working a Megger with the help of a neat diagram.
- e. Describe an overview of application of CRO.
- f. Describe what you understand by the term 'Ratio transformer'. Explain the construction of a ratio transformer and describe its uses.
- g. Explain how a ratio transformer bridge can be used for measurement of :
 - i. Resistance
 - ii. Capacitance
 - iii. Phase angle

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)**Q. 3.**

- a. Describe the construction and working of PMMC instrument. Derive the equation for deflection if the instrument is spring controlled. Describe the method of damping used in these instruments. (9)
- b. Explain and derive the following terms: (6)
 - i. Voltmeter multipliers
 - ii. Ammeter shunt

Q. 4.

- a. Explain the constructional detail and working of a ferrodynamic wattmeter. What is their advantage and disadvantage? Explain. (7.5)
- b. Describe the construction and working of two element induction type energy meter. (7.5)

Q. 5.

- a. Error in measurement can be classified as : gross error, systematic error and random error. Explain these errors by giving suitable examples. Discuss the means adopted to minimize these errors. (7.5)
- b. Draw the block diagram of general purpose CRO and explain the function of the following controls: (7.5)
 - i. intensity
 - ii. focus
 - iii. horizontal and vertical positioning
 - iv. synchronization.

Q. 6.

- a. Define the following terms: (10)
 - i. Repeatability
 - ii. Accuracy
 - iii. Precision
 - iv. Static sensitivity
 - v. Resolution
 - vi. Linearity
 - vii. Static error
 - viii. Relative error
 - ix. Percentage relative error
 - x. True value
- b. What is the advantage of an electronic instrument over electrical and mechanical instrument? (5)

Q. 7.

- a. Define the following terms as used for instrument transformer: (5*1.5)
 - i. Transformation ratio
 - ii. Nominal ration
 - iii. Turn ratio
 - iv. Ratio correction factor
 - v. burden
- b. Described the working and constructional detail of an attraction type moving iron instrument. Discuss its advantages and disadvantages. (7.5)

Enrol. No.

S R H U

Regn. No.

D D

END SEMESTER EXAMINATION, JUNE-2018
PROGRAM : POLYTECHNIC (EE) FOURTH SEMESTER

COURSE CODE: DEET209**COURSE TITLE : MICROPROCESSORS & PERIPHERAL DEVICES****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt **all** questions.**(2 x 10 = 20)**

- a. What is RAM?
- b. What is address bus and data bus?
- c. How many address lines are required for 64 KB memory in 8085.
- d. What is Program Counter?
- e. What is Resolution?
- f. What is AC Flag?
- g. What is RS232 C
- h. What is an Accumulator?
- i. What is 8237?
- j. What is Crystal?

SECTION B**Q. 2.** Attempt **any 5** questions.**(7 x 5 = 35)**

- a. Write ALP program in 8085 to add four data. Assume data yourself.
- b. What is 8255? Explain with control word & pin configuration.
- c. Draw the block diagram of 8085 microprocessor. Explain GPR in 8085
- d. Give the instruction of conditional & unconditional jump instruction explain it.
- e. What is segment memory? How many types of segment memory? Why do we need physical address in 8086?
- f. If 29 H data store in memory location 0400H. Find 2'S complement write program in 8086.
- g. Explain various status flag in 8086 microprocessor.

SECTION CAttempt **any 3** questions.**(15 x 3 = 45)**

- Q. 3.**
 - a. Explain 8086 microprocessor with pin configuration. (7.5)
 - b. If code segment address is 0400H and Instruction pointer address is 0777 H find its physical address. (7.5)
- Q. 4.**
 - a. What is Interrupt in 8085? Explain all the interrupt controllers. (7.5)
 - b. What is timing control signal in 8085? Make the timing diagram for RD signal. (7.5)
- Q. 5.**
 - a. What is A/D & D/A. Define R-2R & Binary weighted method in D/A converter. (7.5)
 - b. Write the basic difference between low level and high level language. Define opcode operand and mnemonics (7.5)
- Q. 6.**
 - a. If three data are 21H, 22H & 23H are located in memory location 2501H, 2502H & 2503H find larger No. with the help of your program at the memory location 2600H program write in 8085. (7.5)
 - b. What is flag status in microprocessor 8086? Explain all the flags. (7.5)
- Q. 7.**
 - a. Write the controlled word for RIM & SIM instruction. Explain 8259. (7.5)
 - b. Write short notes on: (i) Instruction set in 8086 (ii) ALU (iii) BIU (iv) EU (v) Program Counter (7.5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE - 2018
PROGRAM: POLYTECHNIC (EE) FOURTH SEMESTER

COURSE CODE : DEET206**COURSE TITLE : POWER SYSTEMS****[Time allotted: Three hours]****[Max. Marks : 100]****Note:** Attempt all Sections & Questions.**SECTION A****Q. 1.** Attempt all questions.**(2 x 10 = 20)**

- a. Define interconnected grid system.
- b. Give two points of comparison between ac and dc transmission.
- c. Define pin insulator.
- d. Draw the construction of ACSR conductor.
- e. Define diversity factor.
- f. Define load curve.
- g. What do you mean by service mains?
- h. What is distribution system?
- i. Give two tests required for cables.
- j. List the equipment required for carrier communication.

SECTION B**Q. 2.** Attempt any 5 questions.**(7 x 5 = 35)**

- a. Find ABCD parameters for a short transmission line.
- b. Explain the various types of insulators used in transmission system.
- c. Draw and explain the construction of a suspension type insulator used in transmission system.
- d. Derive the expression for sag in a transmission line.
- e. Explain the installation of insulators in transmission system.
- f. Draw a distribution system showing feeders, distributors and service mains.
- g. Explain the location of a fault in an underground cable.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)**Q. 3.** a. Draw the layout of a transmission and distribution power system.**(7.5)**

b. 15000 KVA is received at 33 KV at 0.85 power factor lagging over an 8 Km three phase overhead line.

(7.5)Each line has $R = 0.29 \Omega$ per Km, and $X = 0.65$ per Km. Calculate:

- i. the voltage at the sending end
- ii. the power factor at the sending end
- iii. the regulation
- iv. the efficiency of the transmission line

Q. 4. a. Explain the methods used to improve the voltage distribution in string insulators.**(7.5)**

b. A string of 4 insulator units has self-capacitance equal to 10 times the pin to earth capacitances.

(7.5)

Neglecting leakage, find:

- i. voltage distribution from top to bottom insulator in percentages of the total voltage
- ii. the string efficiency.

- Q. 5.** a. Derive the expression for sag in an overhead transmission line. (7.5)
 b. A 500 V, 2 core feeder 0.8 Km long is required to supply a constant load of 100 KW. The cost of cable including installation charges is Rs (6a + 1.3) per metre, where a is the cross-sectional area of each feeder in sq.cm. Interest and depreciation total is 10 %. Determine the most economical size. Cost of energy is 12 paise per unit; Specific Resistance of copper is $1.75 \times 10^{-6} \Omega / \text{cm}^2$ cross sectional area and 1 cm long. (7.5)

- Q. 6.** A power system had the daily load curve given by the following table:

Time	Load (MW)
12 midnight to 2 am	20
2 am to 8 am	10
8 am to 12.30 pm	50
12.30 pm to 1 pm	40
1 pm to 6 pm	50
6 pm to 12 midnight	70

- a. Plot the load curve and load duration curve. (7.5)
 b. Calculate the load factor and the utilization factor of the plant if the installed capacity is 100 MW. (7.5)
- Q. 7.** a. Draw and explain the various parts of an underground cable. (7.5)
 b. List the various Indian Electricity Rules for transmission lines. (7.5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JULY-2018

PROGRAM : POLYTECHNIC (EE)

FIFTH SEMESTER

COURSE CODE : DEET303

COURSE TITLE : CONTROL SYSTEMS

[Time allotted: Three hours]

[Max. Marks: 100]

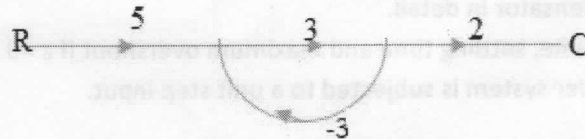
Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- What is a signal flow graph? Explain sink node & forward path.
- Discuss transient and steady state response.
- Find natural frequency if system has closed loop poles at -2 & -4.
- With the help of response curve & expression, discuss unit step & unit ramp signal.
- What are compensators? Why are they used?
- With the help of a block diagram explain the elimination of feedback loop.
- What do you mean by settling time of a response? How does it affect system performance?
- What is a steady state error? Write an expression for it.
- For the given SFG find the transfer function?



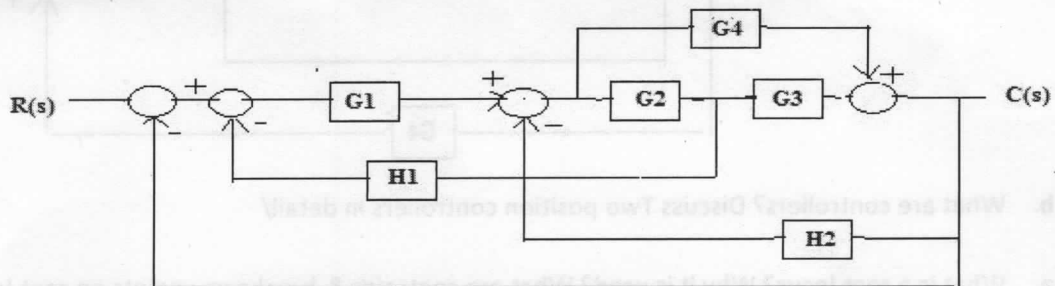
- What do you mean by time constant? How does it effect system response?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- Find $C(s)/R(s)$ using block diagram technique for the fig. given below.



- Discuss static error coefficients. Also find the steady state error for the given forward path transfer function with unity feedback if input is $5t$.

$$\frac{20}{(s+2)(s^2+2s+20)s}$$

- Using Routh's array, find the number of roots lying on RHP, LHP & imaginary axis for the given closed loop transfer function.

$$C(s)/R(s) = \frac{s^3 + 3s^2 + 7s + 24}{s^5 - 2s^4 + 3s^3 - 6s^2 + 2s - 4}$$

- Write an expression for time response of a second order system with unit step input. Also discuss the effect of damping ratio on system response.
- What are servomotors? Explain the construction and working of AC servomotors.
- With the help of a block diagram, explain the working of a bathroom tank controller?

- g. For the following set of equations, draw a suitable SFG and find the transfer function x_5/x_1 .

$$X_2 = a_{12} X_1 + a_{32} X_3 + a_{42} X_4 + a_{52} X_5$$

$$X_3 = a_{23} X_2$$

$$X_4 = a_{34} X_3 + a_{44} X_4$$

$$X_5 = a_{35} X_3 + a_{45} X_4$$

SECTION C

Attempt any 3 questions.

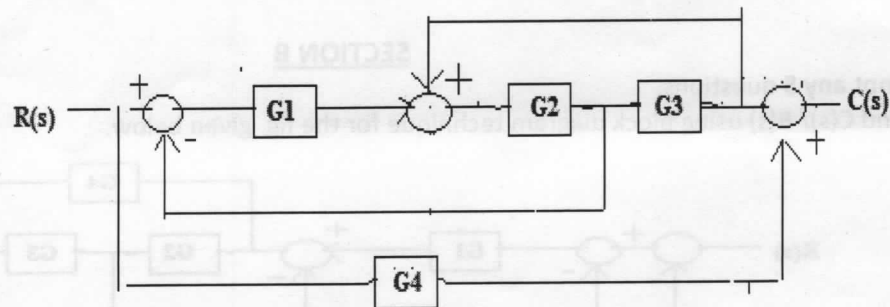
(15 x 3 = 45)

- Q. 3. a. What is a control system? With the help of a block diagram explain : Plant, Controller, Control signal & disturbance. (7.5)
- b. Draw root locus for the unity feedback system with open loop transfer function. (7.5)

$$G(s) = \frac{K}{s(s+4)(s+5)}$$

- Q. 4. a. Explain lead and lag compensator in detail. (7.5)
- b. Calculate rise time, peak time, settling time and maximum overshoot if $\epsilon = 0.5$ & $\omega_n = 6$ rad/sec. (7.5)
- Given that the second order system is subjected to a unit step input.

- Q. 5. a. Draw SFG for the following block diagram & find the number of loops and forward path. (7.5)



- b. What are controllers? Discuss Two position controllers in detail/ (7.5)
- Q. 6. a. What is a root locus? Why it is used? What are centroids & breakaway points on root locus? (7.5)
- b. What are the requirements of a good control system? Differentiate between open & closed loop control systems. (7.5)
- Q. 7. a. What are tachometers? Discuss AC tachometers in detail. (7.5)
- b. Write necessary conditions for a system to be stable. Also explain Routh-Hurwitz criterion. (7.5)

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JUNE-2018
PROGRAM : POLYTECHNIC (ECE) SIXTH SEMESTER

COURSE CODE : DEECT308**COURSE TITLE : DATA COMMUNICATION & COMPUTER NETWORKS****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.**(2 x 10 = 20)**

- a. What is FTP?
- b. Which protocol has two port addresses?
- c. Explain VPN.
- d. What is virtual LAN?
- e. Explain backup server.
- f. What is a hyper terminal?
- g. How many bytes are sent while performing ping on any IP address?
- h. What is hybrid topology?
- i. What is SMTP?
- j. What is the port address of FTP?

SECTION B

Q. 2. Attempt any 5 questions.**(7 x 5 = 35)**

- a. Explain even-odd method for error detection.
- b. How does DHCP work? Why is it important?
- c. Explain the OSI reference model.
- d. Explain the working of Routing Information Protocol.
- e. Explain the working of Post Office Protocol.
- f. What is TELNET and how does it work?
- g. Explain the working of Leaky Bucket algorithm. Why is it used?

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Q. 3.**
- a. What are the characteristics of computer network? **7.5**
 - b. Explain TCP/IP model in detail. Explain all the layers. **7.5**

- Q. 4.**
- a. How do TDMA and FDMA work? **7.5**
 - b. Explain error control and error detection techniques. **7.5**

- Q. 5.**
- a. Explain the working of routing information protocol. **7.5**
 - b. What is virtual LAN? Why it is important? **7.5**

- Q. 6.**
- a. Explain any algorithm for flow control. Why is flow control required? **7.5**
 - b. Explain one algorithm for congestion control. **7.5**

- Q. 7.**
- a. Explain IPV 4 classes and its range. **7.5**
 - b. What do you understand by subnet mask? Why is it required? **7.5**

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATIONS, JUNE - 2018

PROGRAM: POLYTECHNIC (EE / ECE)

SIXTH SEMESTER

COURSE CODE : DEET310/DEECT310

COURSE TITLE : RENEWABLE ENERGY RESOURCES

[Time allotted: Three hours]

[Max. Marks: 100]

Note: Attempt all Sections & Questions.

SECTION A

Q. 1. Attempt all questions.

(2 x 10 = 20)

- What is difference between primary and secondary energy resources?
- State few examples of noncommercial energy resources.
- What is self-shading in solar PV cells?
- What is the comparative speed of Pelton, Kaplan and Francis turbines?
- What are liquid products of pyrolysis process in Biomass?
- What is maximum theoretically possible efficiency of wind turbine?
- What is ring of fire in relation of worldwide geothermal sites?
- What is source of energy for tides? What is time difference between two low tides?
- What is approximate strength of magnetic field required in MHD generation?
- What is key application of fuel cell?

SECTION B

Q. 2. Attempt any 5 questions.

(7 x 5 = 35)

- What is the need of developing non-conventional energy resources?
- What are major factors that are responsible for poor efficiency of solar cells?
- Provide a detailed analysis of advantages and disadvantages of small hydro.
- Explain vertical axis wind turbine (VAWT) with the help of diagram.
- What are advantages and disadvantages of VAWT?
- Explain advantages and disadvantages of geothermal resources.
- Explain two basin schemes for tidal power plant with help of diagram.
- Explain construction and principle of operation of MHD generator with help of diagram.

SECTION C

Attempt any 3 questions.

(15 x 3 = 45)

- Discuss following energy scenario in detail:
 - Solar Energy
 - Wind Energy
 - Describe primary and secondary energy resources with emphasis on form of energy.
- Draw layout of a micro hydro plant. Describe key components of the plant.
 - A PV system feeds a bulb load of 800W. Each solar module has 72 solar cells in 9x8 array. The cell size is 120 mm x 120 mm and cell efficiency is 15%. Assume global radiation incident to panel is 1 KW/m². Calculate no of modules required in array.
- Explain anaerobic digestion with help of diagram.
 - Explain vertical axis wind turbine (HAWT) with the help of diagram. What are advantages and disadvantages of HAWT.
- Explain vapor dominated dry steam system for geothermal electrical power generation.
 - What are limitations of tidal power? Explain single basin scheme for tidal power plant with help of diagram.
- Explain principle and operation of closed cycle MHD generator with help of diagram.
 - Explain alkaline fuel cells with help of diagram.

Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JUNE-2018
PROGRAM : POLYTECHNIC (EE) SIXTH SEMESTER

COURSE CODE: DEEET312**COURSE TITLE : INDUSTRIAL INSTRUMENTATION AND CONTROL****[Time allotted: Three hours]****[Max. Marks: 100]****Note:** Attempt all Sections & Questions.

SECTION A

- Q. 1.** Attempt all questions. (2 x 10 = 20)
- What is a process? Give an example.
 - Name any 2 inductance based transducers and discuss their principles of operation.
 - What is gauge factor? Give its expression.
 - What is helipot? Draw neat labeled diagram to show its construction.
 - Draw diagram of multi-component piezoelectric crystal force transducer.
 - What is a pneumatic load cell?
 - What are Bourden tubes?
 - Discuss the difference between laminar and turbulent flow.
 - What is a thermocouple?
 - Draw diagram for speed measurement of shaft using optical tachometer.

SECTION B

- Q. 2.** Attempt any 5 questions. (7 x 5 = 35)
- Explain the following: (i) Direct and indirect measurement, (ii) Mechanical instruments.
 - Discuss the benefit of bonded metal foil strain gauge over metal wire strain gauge. Also explain the features of bonded metal foil strain gauge with help of neat labeled diagrams.
 - What is torque? Discuss importance of its measurement? Name the 3 methods of measurement of torque and explain any one with neat diagram.
 - Draw neat diagram and discuss magnetic flow meters working.
 - Discuss thermistors with their construction detail and material characteristics (plots).
 - Write down the features of mechanical and electronic measuring instruments. Discuss advantages and disadvantages of each.
 - A strain gauge is bonded to a beam 0.1m long and has a cross-sectional area of 4 cm². Young's modulus for steel is 207 GN/m². The strain gauge has an unstrained resistance of 240 ohms and a gauge factor of 2.2. When a load is applied the resistance of gauge changes by 0.013 ohms. Calculate (i) the change in length of steel beam (in meters) and (ii) the amount of force applied to the beam (in Newtons).

SECTION C

- Attempt any 3 questions. (15 x 3 = 45)
- Q. 3.** **a.** Write down any 7 factors which affect the choice of selection of a transducer. (7.5)
b. What are transducers? Explain features of an electric transducer and write advantages (any 5). (7.5)
- Q. 4.** **a.** Derive the equation of gauge factor of a strain gauge. (Assume required data on your own) (7.5)
b. Explain the working of LVDT with help of a neat labeled diagram. The diagram must have connection showing differential output of LVDT. (7.5)
- Q. 5.** **a.** What is the importance of speed measurement? Name any 4 methods of speed measurement. Explain features of any two of them. (7.5)
b. Discuss load cells and their importance. Explain any 2 types of load cells with neat diagrams. (7.5)
- Q. 6.** **a.** What are bellows? Explain their features. Draw a diagram showing the application of bellows with LVDT to measure pressure. (7.5)
b. Explain the working of ultrasonic flow meters with help of neat labeled diagram. (7.5)
- Q. 7.** **a.** Discuss the bimetallic thermometer operating principle along with its construction and features. Also show an industrial bimetallic thermometer with help of a diagram. (7.5)
b. What is a radiation pyrometer? Explain its principle and write the related equation. Explain the working of an optical pyrometer with help of neat diagram. (7.5)
