

**SUBJECT CODE NO:- E-40**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEP/EE/EEE) Examination Nov/Dec 2017**  
**Network Analysis**  
**(OLD)**

[Time: Three Hours]

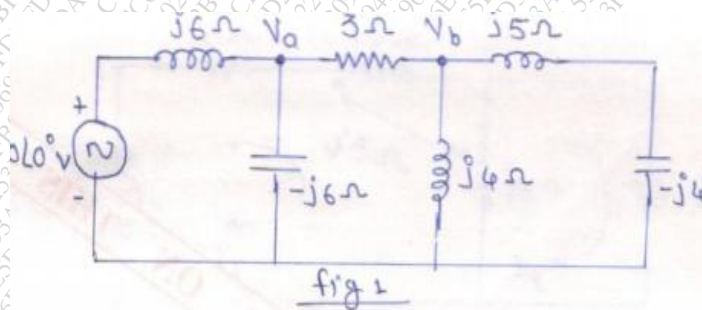
[Max.Marks:80]

Please check whether you have got the right question paper.

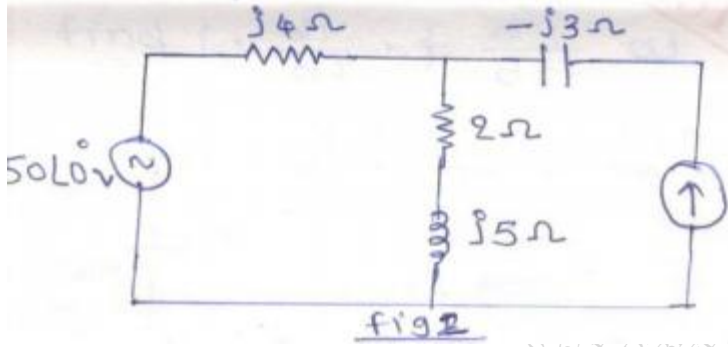
- N.B
1. Q.No.1 from section A and Q.No.6 from section B are compulsory.
  2. Attempt any two questions from the remaining questions.
  3. Assume suitable data, if necessary.

**Section A**

- Q.1 Solve any five. 10
- a) Define
    - i) Linear network
    - ii) Time variant network
  - b) Define mutual inductance?
  - c) Define step & impulse function
  - d) Enlist the applications of Laplace transform
  - e) What is super node?
  - f) Find the Laplace of following function  $t^2$ .
  - g) Define convolution integral?
  - h) State the Thevenin's theorem.
- Q.2 05
- a) Explain in detail mesh analysis with an example. 05
  - b) Find the voltage  $V_a$  &  $V_b$  in the network of fig1. Using Nodal analysis.

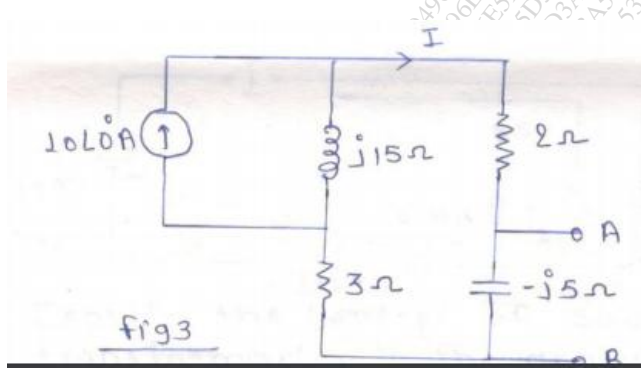


- c) Determine the voltage across the  $(r+j5)\Omega$  impedance for the network shown in fig 2. Using superposition theorem. 05

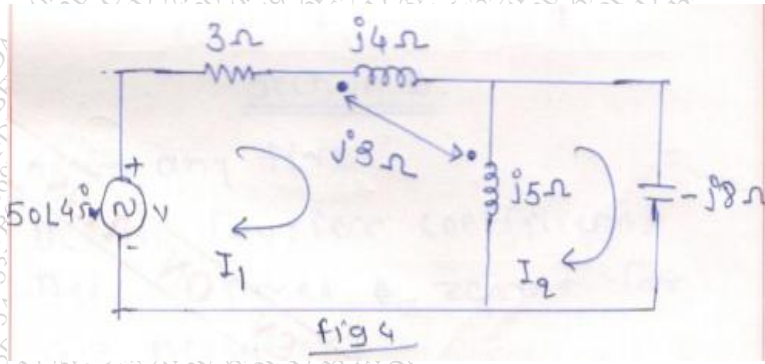


Q.3

- a) State & prove substitution theorem. 05  
 b) Obtain Thevenin's equivalent network for fig 3. 05

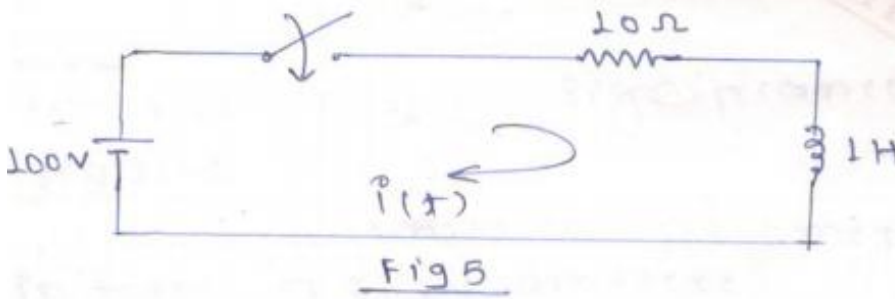


- c) Find current  $I_2$  using mesh analysis for the network in fig.4. 05

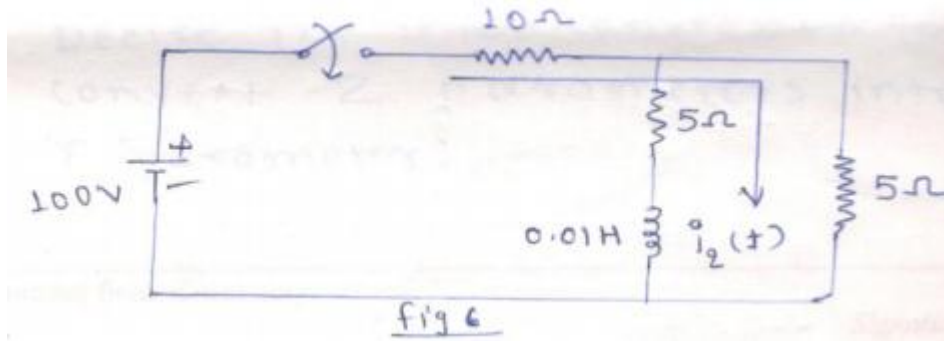


Q.4

- a) In the network of fig 5, the switch is closed at  $t=0$ . With zero current in the inductor find  $i$ ,  $\frac{di}{dt}$ , &  $\frac{d^2i}{dt^2}$  at  $t = 0^+$  07

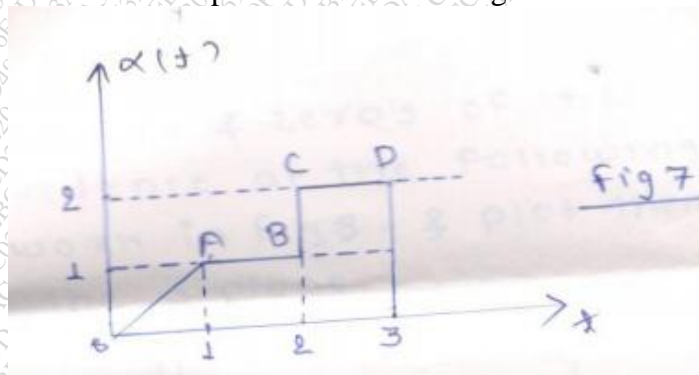


- b) In the network of fig.6, determine current  $i_1(t)$  &  $i_2(t)$  when the switch is closed as  $t=0$  08



Q.5

- a) Explain the concept of source transformation in the analysis of the electrical networks. 07  
 b) Find the Laplace transform of non-periodic function in fig-7. 08



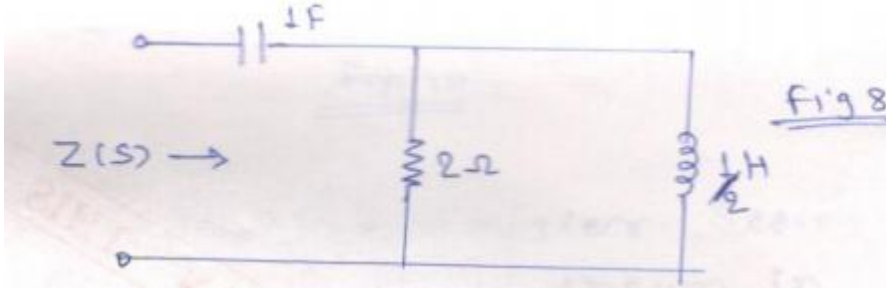
**Section B**

Q.6 Solve any five. 10

- a) Define Fourier coefficients
- b) Define poles & zeros for the network.
- c) What is stability of the active network
- d) Define odd & even symmetry of the waveform.
- e) Define average power & complex power
- f) What is physical significance of reactive power

- g) Write transmission parameters in terms of z parameters.
- h) Enlist the restrictions on poles & zero locations for transfer function.

- Q.7 a) Derive the inter conversion to convert Z parameters into Y parameters. 07  
 b) Find poles & zeros of the impedance of the following network in fig8. & plot them on the s-plane. 08



- Q.8 a) Explain in detail the condition for Reciprocity for the impedance parameters (Z parameters) 07  
 b) Find Y-parameters for the network shown in fig.9. 08

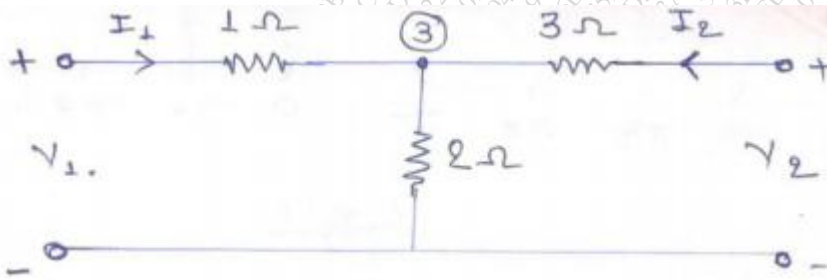


Fig.9

- Q.9 a) What is insertion loss? Explain in detail. 07  
 b) Find the network function  $v_2/v_1$  for the network in fig.10 08

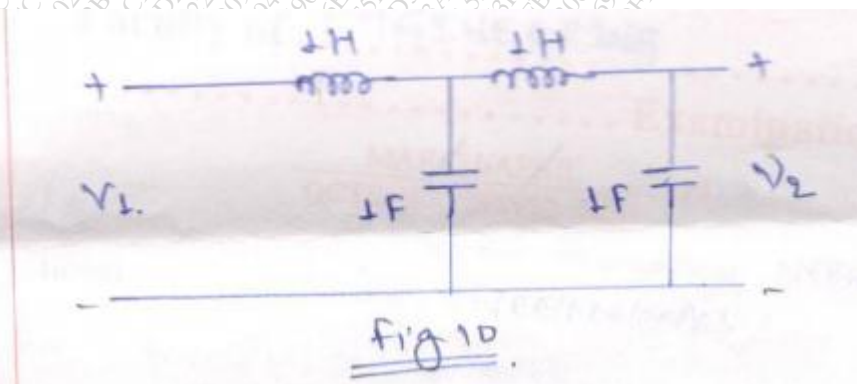
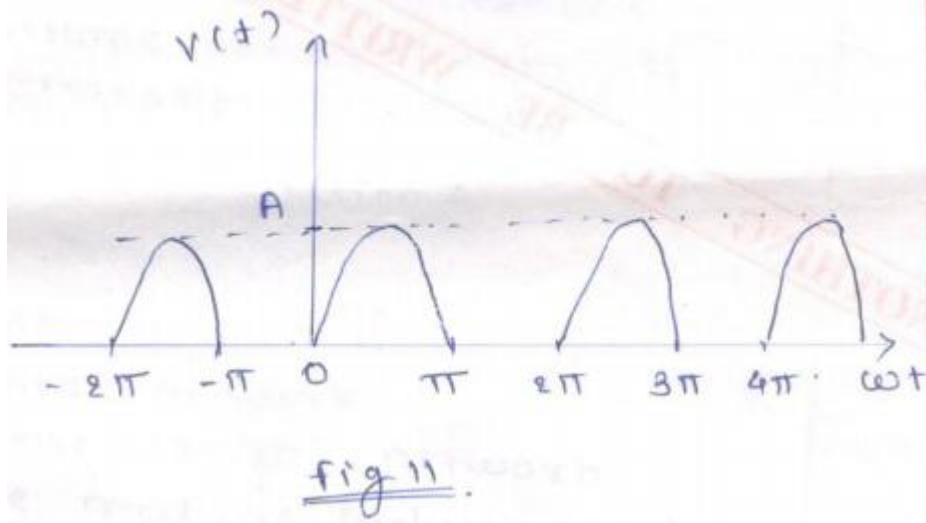


Fig.10

Q.10

a) Evaluate the Fourier series of the waveform shown in fig.11.

07



b) Derive the condition of the reciprocity for z parameters.

08

Total No. of Printed Pages:3

**SUBJECT CODE NO:- E – 72**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEP/EE/EEE) Examination Nov/Dec 2017**  
**Electrical Power Transmission & Distribution**  
**(OLD)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Q.No.1 & Q.No.6 are compulsory.
  - ii. Answer any two questions from Q.No.2 to Q.No.5 from section – A.
  - iii. Attempt any two questions from Q.No.7 to Q.No.10 from section – B.
- Section A

- Q.1 Attempt any five 10
- a) Draw single line diagram showing typical distribution system.
  - b) What are the advantages & disadvantages of HVDC transmission?
  - c) Define tariff. List different types of tariffs.
  - d) Classify transmission line on basis of voltages.
  - e) What is skin effect?
  - f)
    - i. The power loss in an overload transmission line is mainly due to -----.
    - ii. Skin effect is ----- for standard conductor than the solid conductor.
- Q.2
- I) Explain requirements of distribution system. 05
  - II) What is surge arrester? Where & why do we use these equipment's? 05
  - III) State of explain different types of substations. 05
- Q.3
- a) What is basic difference between isolator & circuit breaker? Explain the function of circuit breaker in power system. 05
  - b) Show that in string of suspension insulator, the disc nearest to conductor has the highest voltage across it. 05
  - c) What are the different types of insulators? Write a note on pin type insulator with neat sketch. Find 05
    - 1) The distribution of voltage over 3 insulators
    - 2) String efficiency.
- Q.4
- a) State three parameters of transmission line. What is effect of line parameters on performance of transmission line? 05
  - b) What is skin effect? Why it is absent in D.C system? Explain? 05
  - c) Find an expression for flux linkages due to single current carrying conductor. 05

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- Q.5 Write short note on any three. 15
- A) Ring & radial main system
  - B) Tariff
  - C) GMR & GMD
  - D) Proximity effect.

Section B

- Q.6 Attempt any five 10
- a)
    - i. If supply frequency increases, then skin effect is -----.
    - ii. If length of line decreases, its capacitance is -----.

- b) What is purpose of an overhead transmission line? How are these lines classified?
- c) What is meant by transposition of conductor explain with neat sketch.
- d) State any two faults in underground cable.
- e) What are ABCD constants?
- f) What is main purpose of armoing?
- g) What are effects of lagging & leveling P.F of load on regulating?

- Q.7 a) A single phase overhead transmission line delivers 500KW at 11kV, 0.8 p.f. lagging. If resistance & reactance per conductor is  $0.45 \Omega$  &  $0.08\Omega$  respectively calculate 05
- i. Sending end voltage
  - ii. Transmission efficiency

- b) Derive the expression for capacitance of 3 -  $\emptyset$  line with equilateral spacing. 05

- c) A 3 -  $\emptyset$ , 50Hz, 132kV overhead line has conductors placed in horizontal plane 4.56m apart. Conductor diameter is 22.4mm. If the line length is 100 km, calculate the charging current per phase assuming complete transposition. 05

- Q.8 a) State values of generalized circuit constant of A,B,C &D in case of 05
- i. T – equivalent circuit
  - ii.  $\pi$ - Equivalent circuit of medium transmission line.

- b) What is effect of load power factor on regulation & efficiency of transmission line? Explain. 05

- c) A short 3 -  $\emptyset$  transmission line with an impedance of  $(6 + j8)\Omega$  per phase has sending end & receiving end voltage of 120KV  $\emptyset$  110 KV respectively for some receiving end load at power factor of 0.9 logging – Determine. 05

- 1) Power output
- 2) Sending end power factor

- Q.9 a) Derive expression for sag in overhead line when supports are at equal levels. 05

- b) Write a short note on grading of cables. 05

- c) The towers of height 30m & 90m respectively support a transmission line conductor at water crossing. The horizontal distance between towers is 500m. If the tension in the conductor is 1600kg. Find minimum clearance of conductor & water & clearance midway between supports. Weight of conductor is 1.5 kg/m. Bases of towers can be considered to be at water level. 05

Q.10 Write a short notes on (any three)

- a) Fareuti effect.
- b) Intersheath grading of cable
- c) Types of insulators
- d) XLPE cables.

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Total No. of Printed Pages:2

**SUBJECT CODE NO: E-104**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEP/EE/EEE) Examination Nov/Dec 2017**  
**A.C. Machines**  
**(OLD)**

[Time: 3:00 Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Q. No. 1 & Q. No. 6 are compulsory
  - ii. Solve any two question from Q. No. 2 to Q. No. 5
  - iii. Solve any two questions from Q. No. 7 to Q. No. 10
  - iv. Assume suitable data is required

Section A

- Q.1 Attempt any five 10
- a) A-3ph, 4 pole, 50Hz induction motor runs at 1000 rpm. Determine its percentage slip
  - b) What is plugging?
  - c) What are the factors affecting the speed of 3-ph induction motor?
  - d) Draw torque slip characteristics of 3-ph induction motor.
  - e) How would you reverse the direction of rotation of a capacitor start induction run motor?
  - f) Define the term crawling
  - g) Why does slip vary with load?
  - h) What are the types of starters?
- Q.2 05
- a) A 3-ph, 440v, 6-pole, 50Hz, induction motor mechanical power of 20kw at 985 rpm calculate
    - i) the rotor copper loss
    - ii) the total input power &
    - iii) rotor frequency ( $f_2$ )
  - b) Derive the approximate equivalent circuit of 3-phase induction motor 05
  - c) Explain the working of double cage induction motor. 05
- Q.3 05
- a) Describe the operating principles of FHP synchronous motor, 05
  - b) Describe the construction & operating principles of servo motors 05
  - c) Draw equivalent circuit of 1-ph induction motor describing all parameters. 05
- Q.4 05
- a) Explain construction and working principles of repulsion motor. 05
  - b) What are the losses occur in 3-phase induction motor & state the factors on which that losses depends 05
  - c) Explain double field revolving theory. 05
- Q.5 Write short notes on : 05
- a) Capacitor start and capacitor run induction motor 05
  - b) Induction generator 05
  - c) Speed control methods of induction motors 05

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Section B

10

- Q.6 Attempt any five
- Write the application synchronous motor
  - Draw the equivalent circuit of synchronous motor
  - What is phase swinging in synchrony motor
  - State the different methods of synchronizing the alternator
  - Define locked-rotor torque in synchronous motor
  - Why a 3-phase synchrony motor will always run at synchrony speed
  - What is the use of synchronous condenser
  - Draw vector diagram of loaded alternator for leading power factor.
- Q.7
- Derive the expression for power developed by synchronous motor 05
  - Explain working principles of synchronous motor 05
  - A synchronous motor absorbing 50kw is connected in parallel with a factory load 240 kw having a lagging p.f. of 0.8 of the combined load has a p.f. of 0.9 what is the value of leading KVAR supplied by motor and what p.f. it is working. 05
- Q.8
- Explain armature reaction in synchronous generator 05
  - Explain with neat sketch construction and working of 3-ph synchronous generator 05
  - Explain zero-power factor method for obtaining voltage regulation of alternator 05
- Q.9
- Explain different torque in synchrony motor 05
  - Explain the effect of harmonics on pitch and distribution factor of an alternator 05
  - Explain the effect of varying excitation on armature current and power factor 05
- Q.10 Write shorts notes
- Hunting and damping in synchronous motor 05
  - Starting methods of synchronous motor 05
  - E.M.F equation of Alternator. 05

Total No. of Printed Pages:2

**SUBJECT CODE NO:- E-173**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEP/EE/EEE) Examination Nov/Dec 2017**  
**Analog & Digital Circuits**  
**(OLD)**

[Time: Three Hours]

[Max.Marks:80]

- N.B
- Please check whether you have got the right question paper.
- i. Q.NO.1 and Q.NO.6 are compulsory
  - ii. Attempt from each section any two questions from the remaining questions.
  - iii. Assume suitable data wherever necessary
  - iv. Figure to the right indicate full marks.

Section A

- Q.1 Answer any five 10
- A) Draw pin diagram of IC741
  - B) Draw symbol of PNP and NPN BJT.
  - C) What is zero-crossing detector?
  - D) Draw the input characteristics of common base mode and define its output resistance.
  - E) Mention some commonly used active filters.
  - F) Define Slew rate and CMRR of op amp.
  - G) Define biasing BJT.
- Q.2 A) Compare CB, CC and CE configuration of BJT amplifier. 08
- B) Derive the relation between  $\alpha, \beta$  and  $\gamma$ . 07
- Q.3 A) Draw and explain the circuit diagram of square wave generation using op-amp 07
- B) Explain op-amp parameter in detail. 08
- Q.4 A) Explain pin-diagram of IC555 with neat sketch. 07
- B) With the neat diagram explain Instrumentation Amplifier and its application? 08
- Q.5 Write short note on (Any three) 15
- a) Push Pull Amplifier
  - b) 78XX IC
  - c) First order low pass filter
  - d) FET characteristics

Section B

- Q.6 Answer any five 10
- A) Perform  $(54)_{10} - (33)_{10}$  using 2's complement?
  - B) Give the truth table and graphic symbol of D-flip-flop
  - C) Convert following from gray to binary (110110)
  - D) Convert hexadecimal no. AFC.25 into octal no. Define biasing BJT.
  - E)  $(FA7)_{16}$  &  $(1FD)_{16}$  Add no in binary form?
  - F)  $(1029.55)_{10}$  Convert in to hex. No.
  - G) What are the advantages of dynamic RAM?
- Q.7 A) Minimize the following using k-map 08  
 $F(A,B,C,D,E) = \prod M(6,9,11,13,14,17,20,25,28,29,30)$
- B) Explain race around condition in J-K flip flop? How can reduce it. 07
- Q.8 A) Explain De-Morgan's theorem? 07
- B) What are the advantages and disadvantages of dual slope ADC? Comment on their major applications 08
- Q.9 A) Simplify following Boolean function in SOP form by K-map & draw logic dig. with AND-OR gate.  $F(A,B,C,D,E) = \sum m(0,2,8,9,10,11,14,15)$  07
- B) Using NAND gate sketch clocked S-R flip-flop using this design master slave J-K flip-flop 08
- Q.10 Write shorts note on (any three) 15
- i. Semiconductor memories
  - ii. Characteristics of A to D converter
  - iii. Ring counter
  - iv. IC 555 mode of operation

**SUBJECT CODE NO: E-231**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEP/EE/EEE) Examination Nov/Dec 2017**  
**Transformers & DC Machines**  
**(OLD)**

[Time: 3 Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Q.No.1 and Q.No.6 are compulsory.
  - ii. Solve any two questions from Q.2 to Q.5.
  - iii. Solve any two questions from Q.7 to Q.10.
  - iv. Assume suitable data wherever necessary.

**Section A**

Q.1 Attempt the following. (Any Five)

10

- a) Discuss the working principle of transformer.
- b) Emf per turn of single phase 10KVA, 2200/200 Volts, 50Hz, transformer is 10 volts. Calculate number of primary and secondary winding terms.
- c) What do you mean by no load current in transformer?
- d) Why core of transformer is laminated.
- e) Why rating of transformer is in KVA.
- f) State the necessary conditions for parallel operation of two transformers.
- g) What are the applications of stepper motor?
- h) Define voltage regulation of transformer how does it change with load.

Q.2 a) Explain the method of finding efficiency and regulation of transformer by direct loading. What are its merits and limitations? 07

b) Draw and explain exact equivalent circuit of transformer. 08

Q.3 a) Two single phase transformers of equal voltage ratio are running in parallel and supply a load of 1000 A at 0.8 p.f lag. The equivalent impedances of the two transformers are  $(2 + j3)$  and  $(2.5 + j5)$  ohms respectively. Calculate the current supplied by each transformer and ratio of the KW output of the two transformers. 07

b) Derive an expression for the saving in auto-transformer as compared to conventional transformer. 08

2017

- Q.4 a) Explain with diagram direct load test performed on three phase transformer. 05
- b) Compare three phase transformer with bank of three single phase transformer. 05
- c) What are different three phase transformer connections? Give application of each. 05
- Q.5 Write short notes. (Any Three) 15
- a) Scott connection
- b) Phasor groups and clock notation
- c) Brushless D.C. motor
- d) Sumpner's test
- e) O.C and S.C test

### Section-B

- Q.6 Answer the following. (Any Five) 10
- a) What is a compound generator? What are its types? Explain with the help of diagrams.
- b) What is armature reaction? What is its effect in case of generator?
- c) What are different types of D.C motors? Write expression for back emf in each case.
- d) Name the methods to obtain speed below and above the rated speed for a d. c. motor.
- e) What is function of commutator in d. c. motor?
- f) A 230v d. c. machine has an armature resistance of 0.25 ohm. If the full load armature current is 15A, find induced emf when machine acts as a generator.
- g) Draw load characteristics of d. c. shunt generator. Write its applications.
- h) How is direction of rotation of d.c motor reversed?
- Q.7 a) Draw a section of four pole D.C machine. Label all parts and explain function of each part. 08
- b) What are the different power stages in a d. c. generator? 07
- A long shunt generator running at 1000 rpm, supplies 22KW at a terminal voltage of 220v. The resistance of armature, shunt field and series field are 0.05, 110 and 0.06 ohms resp. The overall efficiency at the above load is 88% find a) cu losses b) iron and friction losses c) the torque exerted by prime mover.

- Q.8 a) Explain various methods of improving commutation in D.C machine. 05
- b) What do you mean by field critical resistance? Explain the necessary conditions for voltage build up of shunt generator. 05
- c) Explain the various characteristics of D.C shunt generator. 05
- Q.9 a) Derive the torque equation of D.C motor. 05
- b) Explain speed current, torque current and speed torque characteristics of D.C shunt motor. 05
- c) A 250 volt D.C shunt motor on load runs at 1000rpm and takes 2A. The field and armature resistances are 250ohm and 0.25 ohms respectively. Calculate the speed when motor is loaded such that it takes 41A and at the armature reaction weakened filed by 3%. 05
- Q.10 Write short notes. (Any three) 15
- a) Solid state starters.
- b) Swinburne test.
- c) EMF equation of D.C machine.
- d) Losses in D.C. machine.
- e) Types of armature windings.

**SUBJECT CODE NO: E-270**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEP/EE/EEE) Examination Nov/Dec 2017**  
**Electrical Measuring Techniques**  
**(OLD)**

[Time: Three Hours]

[Max.Marks:80]

- N.B Please check whether you have got the right question paper.
- i) Q.No.1 & Q.No.6 are compulsory.
  - ii) Attempt any two questions from remaining questions of each section.
  - iii) Assume suitable data wherever necessary.

**Section A**

- Q.1 Solve any five questions.** 10
- a) Define the term linearity and dead zone.
  - b) What are the different types of sources and detectors used in AC bridges?
  - c) Give the classification of measurement resistance with range of resistance.
  - d) What are the advantages of poly-Phase wattmeter?
  - e) What are advantages of bridge circuit?
  - f) Explain absolute instruments.
  - g) Define the term accuracy & linearity.
  - h) What is need of calibration?
- Q.2** 07
- a) Derive the equation of balance for an schering bridge. Draw the phasor diagram for balanced 08 condition.
  - b) The following data relate to the balanced AC bridge as below. 07  
 Arm AB,  $R_1 = 225\Omega$ , Arm BC,  $R_2 = 150\Omega$  in series with  $C_2 = 0.53\ \mu\text{f}$ , Arm CD, armed as unknown; Arm DA,  $R_3 = 100\Omega$  in series with  $L = 7.95\ \text{MH}$ . The oscillator frequency 1KHz. Calculate the constants of atom CD.
- Q.3** 08
- a) With the help of diagram discuss the working principle and construction details of a 08  
 repulsion type moving iron instrument.
  - b) The resistance of moving voltmeter is  $11\ \text{K}\ \Omega$ . The moving coil has 100 turns & is 40mm 07  
 long & 30mm wide the flux density in the air gap is  $0.05\ \text{Wb/m}^2$ .  
 Determine the deflection produced by 220V if the spring control gives a deflection of  $1^\circ$  for a torque of  $20 \times 10^{-7}\ \text{N-m}$ .
- Q.4** 08
- a) Explain the construction and working of an electro-dynamometer type of wattmeter. 08
  - b) A  $3\phi$ , 440 V motor has a power factor 0.6. Two wattmeter connected to measure the power 07  
 show the input to be 25kw. Find the reading on each instrument.
- Q.5** 07
- a) Explain with neat sketch the construction and working of megger. 07
  - b) Explain shunt and multipliers for extension range of ammeter & voltmeter. 08



## Section B

- Q.6 Solve any five questions. 10
- a) What is meant by turns compensation and why it is done?
  - b) What are applications of CRO?
  - c) What is nominal ratio of CT & burden on PT?
  - d) What do you mean by active & passive transducers? Give one example.
  - e) What is strain gauge?
  - f) Why copper shaded bands are used in energy meter?
  - g) What is difference between dual trace and dual beam CRO?
  - h) What is meant by meter constant of energy meter?
- Q.7 a) What are the types of errors and their compensation in energy meter? 08  
b) A single phase energy meter has a constant of 6000 rev/kwh. A test was carried out with a resistive load for one minute during which the meter made 21 revolutions. The voltage was 110 volts and current was 2A. Calculate % error. 07
- Q.8 a) What are advantages of CT and PT over shunt and multipliers for range extension? 08  
b) Explain the method for frequency measurement by lissajous pattern. 07
- Q.9 a) Explain power measurement in  $3\phi$  system for unbalanced load using three wattmeter methods. 07  
b) Explain dual beam CRO working with the help of block diagram. 08
- Q.10 a) Explain inductive and resistive type of transducer. 08  
b) Explain with block diagram the operation of electronic energy meter. 07

Total No. of Printed Pages:2

**SUBJECT CODE NO: E-271**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EE/EEE/EEP)(CGPA) Examination Nov/Dec 2017**  
**Electrical Measuring Techniques**  
**(REVISED)**

[Time: 3 Hours]

[Max. Marks: 80]

Please check whether you have got the right question paper.

- N.B
- i. Q.1 and Q.6 are compulsory.
  - ii. Attempt any two questions from remaining questions in each section.
  - iii. Assume additional data, if required and necessary.

**Section A**

- Q.1 Answer the following (Any Five) 10
- i) Give basic classification of measuring instruments giving one example of each.
  - ii) What are essential requirements of an indicating instrument?
  - iii) Differentiate between scale range and scale span.
  - iv) What is resolution of an instrument?
  - v) Which bridge is used for capacitance measurement? Draw schematic diagram of the bridge.
  - vi) Give two points of comparison between spring control and gravity control.
  - vii) Which type of instruments can be used for measurement of a.c. as well as d.c.? Why?
  - viii) How are resistances classified according to their range write one method of measurement of each.
- Q.2 a) Draw and explain Maxwell's inductance bridge. Derive expression for unknown inductance. Draw phasor diagram for balanced bridge condition. 08
- b) The four arms of a bridge are arms ab: an imperfect capacitor G with an equivalent series resistance  $r_1$ ; 07  
Arms bc: a non-inductive resistance  $R_3$ ; arms cd: a non inductive resistance  $R_4$ ; arms da: an imperfect capacitor  $C_2$  with an equivalent series resistance  $r_2$  in series with resistance  $R_2$ . A supply of 450Hz is given between terminals a and c and detector is connected between b and d. At balance  $R_2=4.8\Omega$ ,  $R_3=2000\Omega$ ,  $R_4=2850\Omega$  and  $C_2=0.5\mu f$  and  $r_2=0.4\Omega$ . calculate the value of  $C_1$  and  $r_1$ .
- Q.3 a) Describe construction and working of PMMC instruments. 08
- b) The inductance of a moving iron instrument is given by: 07  
 $L = (10+5\theta-\theta^2)\mu H$ .  
When  $\theta$  is the deflection in radian from zero position? The spring constant is  $12 \times 10^{-6}$  N.m/rad. Obtain the deflection for a current of 5A.
- Q.4 a) What are the errors in electrodynamic type of wattmeter? How are they compensated? 08
- b) A thrice-phase 500v motor load has a power factor of 0.4. Two watt meters are connected to measure the input powers. Input is read as 30kw. Find the reading of each instrument. 07

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- Q.5 a) With the help of neat diagram explain principle and working of Kelvin's double bridge. 08  
 b) With the help of neat sketch, explain working Earth-Tester. 07

### Section B

- Q.6 Answer the following. (Any five) 10
- i) Differentiate between active and passive transducer with the help of suitable example.
  - ii) Explain principle of resistive transducer.
  - iii) Define the following terms as applied to instrument transformer.
    - a) Turns ratio
    - b) Nominal transformation ratio.
  - iv) What are different types of amplifier used in CRO?
  - v) Why is a short circuiting link provided on secondary side of C.T.?
  - vi) What is a dual beam CRO?
  - vii) How is the frequency of voltage measured with the help of CRO?
  - viii) The name plate of meter reads 1KWH=12000 revolutions. The meter completed 120 revolutions in 60 seconds. Calculate power in circuit.
- Q.7 a) Describe construction and working of single –phase induction type energy meter 08  
 b) Draw the block diagram of basic CRO and explain function of each block. 07
- Q.8 a) What are the advantages of instrument transformers over shunts and multipliers? 08  
 b) Define expression for three phase power for a balanced star connected load. Describe two-wattmeter method of power measurement for such load. Draw vector diagram. 07
- Q.9 a) Explain the effect of secondary burden on the ratio and phase angle errors of a CT. 08  
 b) Explain the sources of errors in single phase induction type energy meter. 07
- Q.10 a) What are inductive and capacitive transducers? Explain their principle using suitable example. 08  
 b) Explain how phase is measured using CRO. 07

**SUBJECT CODE NO: E-311**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEP/EE/EEE) Examination Nov/Dec 2017**  
**Electrical Power Generation & its Economics**  
**(OLD)**

[Time: Three Hours]

[Max.Marks:80]

N.B Please check whether you have got the right question paper.

1. Q.No.1 and 6 are compulsory.
2. Attempt any two questions from remaining four questions from each section.
3. Assume suitable data if necessary.
4. Figure to the right indicate full marks.

**Section A**

- Q.1 Solve any two. 10
- a) Explain coal handling in thermal power plant.
  - b) Explain the principle of working by hydroelectric power plant.
  - c) What is chain reaction ?how is nuclear reaction controlled in a reactor?

- Q.2 08
- a) Draw the general layout of a thermal power plant.
  - b) Draw the neat sketch of hydropower plant. 07

- Q.3 08
- a) Explain the site selection factors of hydroelectric power plant.
  - b) What is the function of 07
    - 1) Super heater
    - 2) Deaerator
    - 3) Economizer
    - 4) Condenser
    - 5) Main valve in thermal power plant

- Q.4 07
- a) Explain the nuclear reaction in nuclear power plant.
  - b) The mean monthly discharge for 12 months at a particular site of a river is given below. 08

| Month | Discharge in millions m <sup>3</sup> /month | Month | Discharge in millions m <sup>3</sup> /month |
|-------|---|-------|---|
| A     | 500   | O     | 2000  |
| M     | 200   | N     | 1500  |
| J     | 1500  | D     | 1500  |
| J     | 2500  | J     | 1000  |
| A     | 3000  | F     | 800   |
| S     | 2000  | M     | 600   |

Draw the hydrograph for the given discharge & fluid the arrange monthly flees take 30 days in month.

- Q.5 Write a short note on. (any three)
- a) Nuclear materials used in nuclear reactor 05
  - b) Which factors are considered for Nuclear power plant site selection 05
  - c) Explain with diagram any one element of thermal power plants. 05
  - d) Penstock & surge tank 05

## Section B

- Q.6 Solve any two questions. 10
- a) Discuss the principle of operation of an open cycle gas turbine plant.
  - b) Discuss the advantages and disadvantages of gas power plant.
  - c) Briefly discuss the fuel storage and fuel admission system of diesel electric plants.
- Q.7 08
- a) Explain the comparison of all power plants.
  - b) Which are components of gas power plant explain with their function operation. 07
- Q.8 07
- a) State the advantages of tidal power plants.
  - b) Explain MHD power generation. 08
- Q.9 08
- a) Explain solar power.
  - b) Discuss the basic requirements of peak load plants. 07
- Q.10 Write a short note on. (any three) 05
- a) Gas fuels in gas turbine plant 05
  - b) Write down benefits of inter connected system 05
  - c) Base load & peak load plant 05
  - d) Which are constrains of economic power generation 05

Total No. of Printed Pages:2

**SUBJECT CODE NO: E-312**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EE/EEE/EEP)(CGPA) Examination Nov/Dec 2017**  
**Electrical Power Generation & its Economics**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Q.No.1 from section A and Q.No.6 from section B are compulsory.
  - ii. Attempt any two questions from the remaining questions in each section.
  - iii. Assume suitable data if necessary.
  - iv. Figure to right indicate full marks.

**Section A**

- Q.1 Solve any five questions. 10
- a) Write the types of boilers?
  - b) What is the function of surge tank?
  - c) What is hydrology?
  - d) Write the classification of nuclear reactor.
  - e) Write the function of super heater?
  - f) What are the types of gates?
  - g) What are the auxiliary equipment for Diesel Power Plant?
  - h) Draw the sketch of penstock.
- Q.2
- a) What are the factors to be considered for selection of the site for a thermal power station. 05
  - b) Briefly describe the main parts and the working of a steam power station 05
  - c) Write short note on condenser. 05
- Q.3
- a) What are the steps for ash disposal and dust collection? 05
  - b) Explain the general arrangement and operation of a hydroelectric plant. 05
  - c) Write short note on water hammer and surge tank. 05
- Q.4
- a) What are the methods of producing nuclear reaction? What is chain reaction? 05
  - b) List out main parts of a reactor and briefly state their functions. 05
  - c) What are the advantages and disadvantages of the nuclear power station? 05
- Q.5
- a) Describe briefly the main components of a diesel electric plant. 05
  - b) What are the factors of selecting a site for diesel electric station? 05

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c) Draw the hydrograph and fluid average monthly flow.

05

| Month     | Discharge m <sup>3</sup> /s |
|-----------|-----------------------------|
| Jan       | 1000                        |
| Feb       | 500                         |
| March     | 800                         |
| April     | 500                         |
| May       | 200                         |
| June      | 1500                        |
| July      | 2500                        |
| Aug       | 3000                        |
| September | 2400                        |
| October   | 2000                        |
| November  | 1500                        |
| December  | 1500                        |

### Section B

Q.6 Solve any five questions.

10

- Write the applications of Gas turbine plants.
- What is the function of compressors?
- What is a fuel cell?
- Draw the sketch of wind power mill.
- Draw the sketch of incremental fuel cost curve.
- Differentiate between fixed cost and operating cost.
- What is meant by zero energy house?
- Define load factor and diversity factor

Q.7

- Describe briefly a gas turbine plant.
- What gas power plant used as peak load power plants?
- Explain the open cycle gas turbine plants.

05

05

05

Q.8

- Explain MHD plant with diagram.
- Explain the horizontal axis wind mill with neat sketch.
- What are the advantages of tidal power plant?

05

05

05

Q.9

- Explain the comparison of all power plants.
- How is reduction of cost is done by using inter connecting generators.
- What are constraints of economic generation?

05

05

05

Q.10 Write short note on any three.

15

- Solar energy
- Geothermal power generation
- Base load and peak load plants
- Wind

Total No. of Printed Pages:2

**SUBJECT CODE NO:- E-355**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEE) Examination Nov/Dec 2017**  
**Electronics Devices and Circuit**  
**(OLD)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Attempt any three questions from each section.
  - ii. Question no.1 & Question no. 6 are compulsory.

**SECTION A**

- Q.1 Answer any five: 10
- a) What is rectifier.
  - b) State Base width modulation effect.
  - c) What is coupling in amplifiers.
  - d) What do you mean by Depletion mode in MOSFET.
  - e) What is voltage regulation?
  - f) Define: i) Ripple factor                      ii) Efficiency
  - g) What is need of biasing in transistor.
  - h) Obtain the relation between  $\alpha$  and  $\beta$ .
- Q.2 a) Explain construction and operation of Bridge rectifier. Also draw input & output wave forms. 08
- b) Explain the operation of voltage multiplier circuit with two diodes. 07
- Q.3 a) Explain the operation of transistor as switch. 07
- b) Explain N-channel JFET with its drain characteristics. 08
- Q.4 a) What is biasing? Explain the voltage divider biasing method in BJT. 08
- b) Explain Depletion and Enhancement Type MOSFET in detail. 07
- Q.5 Write notes on: 15
- i. Transistor testing by different methods.
  - ii. Power MOSFET.
  - iii. FET Biasing.



SECTION B

- Q.6 Answer any five. 10
- a) What is frequency response of amplifier.
  - b) State the effect of feedback on gain of amplifier.
  - c) Draw H-equivalent circuit of BJT.
  - d) What do you mean by 'Drift' in amplifiers.
  - e) What is the criteria for oscillations.
  - f) State the applications of coupled amplifier.
  - g) What is current and voltage feedback in amplifiers.
  - h) State 'millers theorem' in amplifiers.
- Q.7 a) Explain R-C coupled amplifier with its Frequency response. 08  
b) Derive the effect of feedback on gain, Input and output impedance, Bandwidth, Noise, and 07  
distortions in amplifiers.
- Q.8 a) What is power amplifier? Explain the working of push pull amplifier. 08  
b) Explain the working of RC-phase shift oscillator. 07
- Q.9 a) Explain the voltage tuned amplifiers. 08  
b) Explain emitter follower analysis and boot strapping in emitter follower. 07
- Q.10 Write notes on. 15
- i. Hybrid Pi equivalent circuit.
  - ii. Feedback Amplifiers.
  - iii. LC oscillators.

Total No. of Printed Pages:2

**SUBJECT CODE NO:- E-356**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EE/EEE/EEP)(CGPA) Examination Nov/Dec 2017**  
**Elective - I: Electrical Engineering Materials**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B Q. No.1 and 6 are compulsory. Solve any two from remaining from each section.

**Section A**

- Q.1 Solve any five of following 10
- a) State Properties of good Insulating material.
  - b) List optical properties of material used for power generation.
  - c) Define dielectric constant and dipole moment.
  - d) Define polarization.
  - e) Classify magnetic material.
  - f) State various factors affecting on Breakdown voltage.
- Q.2 a) Explain construction, equivalent circuit, and application of photovoltaic cell with neat diagram. 08
- b) Explain the properties of fibers Insulating materials also state its application. 07
- Q.3 a) State the properties of magnetic material. And differentiate between soft and hard magnetic material. 07
- b) What are ferrites? Enlist some ferrites with their applications. 08
- Q.4 a) Explain the Insulating material used for rotating machines. 07
- b) Explain Electronic, Ionic and oriental polarization. 08
- Q.5 Write short notes on ( any three) 15
- i) Transformer oil
  - ii) Ferro- electricity
  - iii) Primary Ionization in gases
  - iv) Magnetic recording material

## Section – B

- Q.6 Solve any five 10
- a) State properties of thermal conduction material.
  - b) List out properties of material used for transmission line conductor.
  - c) What is superconductivity?
  - d) State properties of Nano- tubes.
  - e) What is soldering material?
  - f) For what purpose IS6798 is used.
- Q.7 08
- a) Discuss working of thermal Bimetal and thermocouple.
  - b) Explain properties of copper and its alloys. 07
- Q.8 08
- a) Explain various conducting mechanism in Nano- structures.
  - b) Explain BN Nanotubes in detail. 07
- Q.9 08
- a) How to measure KVAR capacity of Power capacitor as per IS 2834 of 1986.
  - b) Explain measurement of flux density by Gauss- meter. 07
- Q.10 Write a short note on ( any three) 15
- a) Nichrome and Eureka
  - b) Concept of Energy bands
  - c) Application of Nano- material
  - d) Single electron transistor

**SUBJECT CODE NO: E-357**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EE/EEE/EEP)(CGPA) Examination Nov/Dec 2017**  
**Elective – I**  
**Electronics Devices & Circuits**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- 1) Question No. 1 and 6 are compulsory
  - 2) Solve any two questions from Q.no.2 to Q. no.5 and Q. no.7 to Q. No.10
  - 3) Assume suitable data if required

**Section A**

- Q.1 Solve any five 10
- a) Describe the constructional features of MOSFET.
  - b) What do you mean by Ripple Factor.
  - c) Explain the operation of NPN transistor.
  - d) What is load regulation & sources regulation.
  - e) Why do we need filters in power supplies?
  - f) What is quiescent point. How stabilization is obtained?
  - g) For the values of  $\alpha = 0.96$ ;  $I_{CBO} = 6\mu A$ ;  $I_B = 98\mu A$ , find the values of  $I_E$  &  $I_C$ .
- Q.2 Solve the followings
- a) Explain the operation of Half wave Rectifier with relevant waveforms and derivation state advantages and disadvantages. 08
  - b) Explain the working of various configurations of BJT with input & output characteristics. 07
- Q.3
- a) Compare the filter circuits of L, C & L-C. 08
  - b) Draw the V-I characteristics of n – channel JFET and explain the same in detail. 07
- Q.4
- a) Explain the operation of Full wave Bridge rectifier with appropriate waveforms and explain the advantages of full wave Bridge rectifier. 08
  - b) How stability factor is calculated in fixed biasing method of BJT. Explain it with help of circuit. 07
- Q.5 Write short notes on followings 15
- a) Biasing Techniques of a transistor
  - b) Enhancement MOSFET
  - c) What is a dc load line & relevance of selecting operating point in CE.

## Section – B

- Q.6 Solve any five 10
- a) Describe the operation of tank circuit in oscillators.
  - b) What do you mean by the voltage shunt amplifier.
  - c) State the Barkhausen criteria.
  - d) What is cross – over distortion.
  - e) What are the effects of negative feedback on gain of amplifiers?
  - f) Give the classification of amplifiers.
  - g) State the Miller’s theorem.
- Q.7 a) Explain the small signal high frequency CE model of transistor. 08  
b) What is feedback amplifier & describe the effect of feedback on gain & Bandwidth. 07
- Q.8 a) Explain the operation of RC phase shift Oscillator. Sate its advantages & disadvantages. 08  
b) Describe the operation of class – B push pull amplifier. Comment on the advantages & disadvantages in comparison with other classes amplifier. 07
- Q.9 a) Explain operation of Hartley Oscillator. Derive the relation of frequency of Oscillation. 07  
b) Explain the working of class A amplifier with necessary circuit diagram. 08
- Q.10 Write short notes on following 15
- a) Tuned amplifier
  - b) Crystal oscillator
  - c) Push pull amplifier

Total No. of Printed Pages:2

**SUBJECT CODE NO: E-358**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EE/EEE/EEP)(CGPA) Examination Nov/Dec 2017**  
**Elective - I: Numerical Method Using MATLAB**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- 1) Q. no.1 & 6 are compulsory
  - 2) Solve any two question from each section
  - 3) Assume suitable data
- Section A**
- Q.1 Write a note on ( any two) 10
- a) Array operation in matlab.
  - b) Global & local truncation error.
  - c) Matlab functions for integration.
- Q.2 08
- a) State & explain with suitable examples in build functions of matlab.
  - b) Write a program to plot a graph of t & v arrays of data with heading mentioning x & y axis label in grid view (assume data). 07
- Q.3 08
- a) Evaluate the polynomial  $y = x^3 - 7x^2 + 8x - 0.35$  at  $x = 1.37$  use 3 digit arithmetic with chopping. Evaluate the percent of relative error. 08
  - b) Explain in detail round off errors. 07
- Q.4 08
- a) State & explain Newton cotes integration formulae. 08
  - b) Explain trapezoidal rule of integration with suitable example. also mention error of trapezoidal rule. 07
- Q.5 08
- a) Explain error propagation in matlab. 08
  - b) Explain loop & execution control in matlab. 07

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Section B

- Q.6 Write a short note on any two 10
- a) Linear algebra in Matlab.
  - b) Interpolation in matlab .
  - c) Higher order runge- kutta method.
- Q.7 a) Use gauss seidel method to obtain sol<sup>n</sup> for 08
- $3x_1 - 0.2x_2 - 0.2x_3 = 7.85$   
 $0.1x_1 + 7x_2 - 0.3x_3 = -19.3$   
 $0.3x_1 - 0.2x_2 + 10x_3 = 71.4$   
where  $x_1 = 3, x_2 = -2.5, x_3 = 7$
- b) Use the multiple equation newton raphson method to determine roots of 07
- $x_1^2 + x_1 x_2 = 10$   
 $x_2 + 3x_1 x_2^2 = 57$   
with  $x_1 = 1.5$  &  $x_2 = 3.5$
- Q.8 a) Write a M file to implement Newton Interpolation. 08
- b) Explain Linear least square regression in matlab. 07
- Q.9 a) Write a M file to implement Higher order runge- kutta method. 08
- b) Explain matlab ode 45 algorithm. 07
- Q.10 a) Explain functional & nonlinear regression using matlab. 08
- b) Explain implicit Euler's method. 07





## Section B

- Q.6 a) Find correlation of following sequences  $x(n) = \{1 \ 2 \ 3 \ 4\}$   $y(n) = \{4 \ 3 \ 2 \ 1\}$  08  
↑ ↑
- b) State & explain properties of auto correlation 07
- Q.7 a) Explain the necessity of CT & DT Fourier series & Fourier transform 08
- b) State & Explain properties Fourier series 07
- Q.8 a) Explain in detail sampling & effect of under sampling. 08
- b) Explain sampling of band pass signals 07
- Q.9 a) Explain energy signal & power signal 08
- b) State & explain properties of ESD 07
- Q.10 Solve any two (short note) 10
- a) PSD
- b) Correlation & correlogram
- c) Fourier transform & its properties

Total No. of Printed Pages:2

**SUBJECT CODE NO:- E-365**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**S.E.(EEP/EE) Examination Nov/Dec 2017**  
**Electrical Engineering Materials**  
**(OLD)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Question no. 01 and quest no. 06 are compulsory.
  - ii. Solve any two questions from remaining questions in each section.

**SECTION A**

- Q.1 Solve any five. 10
- a) Define Dielectric constant.
  - b) Classify Magnetic Material.
  - c) Define Breakdown voltage and state factors affecting on it.
  - d) Define Electric Dipole moment.
  - e) What do you mean by dielectric loss?
  - f) State and explain properties of SF<sub>6</sub> gas.
  - g) What is Impregnation? Give its procedure.
- Q.2
- a) Define polarization and explain the phenomenon of electronic polarisation. 07
  - b) State and explain the desirable properties of good insulating material. 08
- Q.3
- a) Explain in detail various properties of materials used in line insulators. 07
  - b) Differentiate in between Soft magnetic material and hard magnetic material. 08
- Q.4
- a) Explain in detail hysteresis loop in ferromagnetic material. 07
  - b) What is meant by primary ionization and explain its types. 08
- Q.5 Solve any three. 15
- Write a short notes on.
- a) Diamagnetism.
  - b) Materials used in rotating machine.
  - c) Magnetostriction with application.
  - d) Loss Tanget and its significance.
  - e) Clqusius Mossotti Equation.

## SECTION B

- Q.6 Solve any five. 10
- a) List down the properties of conductor.
  - b) Define super conductivity and Resistivity.
  - c) State risk factors of Nanotechnology.
  - d) What is thermal bimetal?
  - e) What is type test carried on capacitor?
  - f) State the application of nanotubes.
  - g) What is Partial Discharge?
  - h) State the properties of tungsten and manganin.
- Q.7 a) Explain the measurement of flux density by using gauss meter. 07  
b) Explain the properties & applications of silver & its alloy's. 08
- Q.8 a) What is thermocouple? Explain its features and applications. 07  
b) How to measure KVar capacity of power capacity? 08
- Q.9 a) Explain BN nanotubes in detail. 07  
b) Explain the concept of energy bands in detail. 08
- Q.10 Write a short note on. (Any three) 15
- a) Application of nanomaterials.
  - b) Testing of High voltage cable.
  - c) Materials used in transmission Line.
  - d) Nanowires.
  - e) Measurement of dielectric strength of liquid insulating material.