

**FACULTY OF ENGINEERING****B.E. 2/4 (Civil) I-Semester (Main & Backlog) Examination, December 2016****Subject : Engineering Geology****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- 1 Define Mineral. Specify any three name's of Rock forming minerals.
- 2 Differentiate between sedimentary rocks and igneous rocks? With examples.
- 3 List out the eight groundwater provinces of India.
- 4 Differentiate between weathering and erosion.
- 5 Explain about Aerial photographs.
- 6 List out the common geological structures and briefly explain about them.
- 7 Illustrate the geology of Nagarjuna sagar dam.
- 8 Explain about seismic refraction method.
- 9 Identify the elements at risk with respect to landslides.
- 10 Define the term's tunnel and Tsunami.

**PART – B (50 Marks)**

- 11 a) How is geology related to engineering? Discuss the importance of geology in the field of Civil Engineering.  
b) Explain in detail common structure's of metamorphic and igneous rocks.
- 12 a) Define fold? Describe various parts of fold. Discuss the importance of fold in the field of Civil Engineering.  
b) Explain Darcy's law? Add a note on occurrence of ground water in soft rocks.
- 13 a) Describe the electrical resistivity method of groundwater exploration. Add a note on its merits and demerits.  
b) Explain engineering properties and constructional uses of following rocks.  
A) Gabbro      B) Granite      C) Limestone      D) Gneiss
- 14 a) Explain the geological and engineering consideration in selection of concrete aggregate and building stones.  
b) Describe engineering geology of major dams of India.
- 15 a) Explain in detail the causes, effective and mitigation measures of earthquakes.  
b) Discuss in detail merits and demerits of tunnels in soft rocks.
- 16 a) Explain the application of remote sensing and GIS technique in civil engineering projects.  
b) Explain about stress-strain behaviour of rocks.
- 17 a) Describe the various components of hydrological cycle with neat sketch.  
b) Define the terms  
A) Stand-up time      B) Over break in Tunnel's

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**FACULTY OF ENGINEERING****B.E. 2/4 (EEE/Inst.) I - Semester (Main) Examination, November / December 2016****Subject : Electrical Measurements and Instruments****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 Explain the term: (i) Hysteresis Error (ii) Error on account of stray magnetic fields (iii) Temperature Error for indicating instrument. (3)
- 2 What is phantom loading? Explain how it is advantages then testing with direct loading. (3)
- 3 What is synchronizing? Under what conditions 3-phase alternator. Can be synchronized to 3-phase bus bars? (2)
- 4 Mention the different methods used for measurement of medium resistances. (3)
- 5 What are the sources of null detectors that are used for a.c. bridges? (2)
- 6 What is the principle of working of Hall Effect Transducers? (2)
- 7 A ballistic galvanometer has a resistance of  $150\Omega$  and an undamped period of 7.5 sec. A steady emf of 3.5mV produces a deflection of 120mm. Determine the quantity of electricity discharged from the capacitor if the deflection produced is 750 mm. The relative damping is 0.8. (3)
- 8 What is meant by standardization of a DC potentiometer? (2)
- 9 Give the applications of CRO. (3)
- 10 Mention the use of flux meter. (2)

**PART – B (50 Marks)**

- 11 (a) Derive the expression for deflection of an Quadrant Electrometer in case of Hetero static connection. (5)
- (b) Explain the sources of error advantages and disadvantages Electro meter type instruments. (5)
- 12 (a) Describe the construction and working of a two element Induction type energy meter. (5)
- (b) Explain the advantages and disadvantages of moving iron type power factor meters. (5)
- 13 (a) Derive the Equation of balance for an Andersons bridge with phasor diagram. Also list the advantages and disadvantages of the bridge. (5)
- (b) Explain the principle and working of Hall effect transducers. (5)
- 14 Explain the construction and working of Ballistic galvanometer. Prove that the charge is proportional to first swing of the moving coil. (10)
- 15 Derive the equivalent circuit and phasor diagram of a current transducer. Also derive the expression for ratio and phase angle errors? (10)

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- 16 (a) Explain the principle of Ioyd fisher square for measurement of iron losses in a specimen of lamination. (5)
- (b) A strain gauge having a resistance of  $100\ \Omega$  and gauge factor of 2 is connected in series with a ballast resistance of  $100\ \Omega$  across 12V, supply. Calculate the difference between the output voltage with no stress applied and stress of  $140\ \text{MN/m}^2$ . The modulus of elasticity is  $200\ \text{GN/m}^2$ . (5)
- 17 (a) Explain the term "standardization" with neat sketch. Explain the working of Crompton's potentiometer. When measuring an unknown resistance. (5)
- (b) Explain the working of Wagner's Earthing device. (5)

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**FACULTY OF ENGINEERING****B.E. 2/4 (ECE) I - Semester (Main) Examination, November / December 2016****Subject : Electronic Devices****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 Differentiate between transition capacitance and diffusion capacitance of PN junction diode. (2)
- 2 The diode current is 0.6mA when the applied voltage is 400mV and 20mA when applied voltage is 500mV. Determine  $\beta$ . Assume  $kT/q = 25mV$ . (3)
- 3 What are the advantages and disadvantages of bridge rectifier? (2)
- 4 Explain the purpose of bleeder resistor in LC or L section filter? (2)
- 5 What is Early Effect or Base Width Modulation in a transistor? (2)
- 6 What is thermal runaway in transistors? Write a condition to avoid this. (3)
- 7 Why h-parameters are preferred to analyze a circuit using BJT. (2)
- 8 What are the differences in BJT and FET? (3)
- 9 Sketch and explain the small signal model of JFET. (3)
- 10 For a transistor find  $\beta$ ,  $\beta_{DC}$  and  $I_E$  when  $I_C = 5mA$ ,  $I_B = 100\mu A$ . (3)

**PART – B (50 Marks)**

- 11 (a) What is PN junction diode? Explain the working of PN junction under forward bias and reverse bias with neat diagram? (6)
- (b) Write the differences between Zener break down and Avalanche break down in diodes? (4)
- 12 (a) Derive ripple factor of full wave rectifier with choke or Inductor filter? (5)
- (b) A 220V, 50Hz ac voltage is applied to the primary of 4:1 step down transformer which is used in full wave rectifier having a  $R_L = 1K$  uses Si diode with  $R_f = 50$ . Determine the following. (i) DC output voltage (ii) DC power delivered to load (iii) PIV of each diode (iv) Efficiency (v) Ripple frequency (5)
- 13 (a) Derive the stability factor equation for a Collector to base bias circuit. (5)
- (b) In the case of collector to base circuit if  $\beta = 40$ ,  $R_C = 4.7K$  and  $R_B = 80K$ . Determine the value of stability factor S. (5)
- 14 (a) How to derive an approximate model from exact model of h-parameters. Draw an approximate model for CE amplifier. (5)
- (b) A junction transistor connected in self bias has the following h-parameters  $h_{ie} = 1200$ ,  $h_{re} = 2 \times 10^{-4}$ ,  $h_{fe} = 60$ ,  $h_{oe} = 25\mu A/V$ . Determine the  $A_i$ ,  $A_v$ ,  $Z_i$ ,  $Z_o$  of the CE amplifier using exact analysis. The load resistance  $R_L = 2K$ , source resistance  $R_S = 900$ ,  $R_1 = 50K$ ,  $R_2 = 1K$  and  $R_C = 1K$ . (5)

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- 15 (a) Explain the construction and operation of n-channel JFET and draw drain and transfer characteristics. (6)  
(b) Differentiate between depletion and enhancement MOSFETS. (4)
- 16 (a) Draw and explain the circuit of Uni- Junction transistor and plot the I<sub>c</sub>-V<sub>ce</sub> characteristics. (5)  
(b) Compare CB, CE and CC amplifier performance parameters. (5)
- 17 Write short notes on the following. (10)  
(a) Bias compensation techniques  
(b) FET as voltage variable resistor  
(c) Silicon Controlled Rectifier

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**FACULTY OF ENGINEERING****B.E. 2/4 (A.E.) I - Semester (Main) Examination, November / December 2016****Subject : Automotive Electrical and Electronics****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 Briefly explain maintenance of Lead acid battery. (3)
- 2 List out the essential accessories of an automobile. (2)
- 3 What are the conditions for starting an engine by a self starter motor? (3)
- 4 What is sulphation and trickle charging? (2)
- 5 In a generator Explain about third brush control. (3)
- 6 What is principle of an alternator? (2)
- 7 What are the security and warning systems, employed in automobile? (3)
- 8 List out the various sensors used for measurement of temperature. (2)
- 9 What is the purpose of using cutout relay? (2)
- 10 Explain differences between D.C. generator and alternator. (3)

**PART – B (50 Marks)**

- 11 (a) Discuss various tests conducted on batteries. (5)  
(b) Explain about Lighting system of an automobiles. (5)
- 12 Explain principle and working of series motor along with its characteristics. (10)
- 13 (a) Discuss about shunt generator characteristics. (5)  
(b) Explain about voltage and current regulators. (5)
- 14 Discuss various sensors used for measurement of pressure. (10)
- 15 (a) Briefly explain about microprocessor and its applications in an automobile. (5)  
(b) Discuss about Electrical Horn system. (5)
- 16 (a) Explain briefly various characteristics of a battery. (5)  
(b) Explain constructional details of alternator. (5)
- 17 Write short notes on the following:  
(a) Electromagnetic compatibility (5)  
(b) Current trends in automotive electronic engine management system (5)

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**FACULTY OF ENGINEERING****B.E. 2/4 (CSE) I - Semester (Main) Examination, November / December 2016****Subject : Computer Architecture****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 What logic micro operations can be performed with two variables? (3)
- 2 What are the various phases of each instruction cycle? (2)
- 3 What is the use of control address register in micro programmed control organization? (3)
- 4 Evaluate the arithmetic expression using memory stack  $X=P*Q/R*(S*T+U)$  (3)
- 5 What is an array multiplier? (3)
- 6 List the characteristics of CISC processor. (2)
- 7 What are the functions of an I/O processor? Explain. (3)
- 8 What is Interrupt driven I/O? (2)
- 9 List the advantages of virtual memory? (2)
- 10 Define hit ratio. (2)

**PART- B (50 Marks)**

- 11 (a) Design a bus system with multiplexers and other gates for communicating between 5 registers? (5)  
(b) Differentiate between register reference and memory reference instructions. (5)
- 12 (a) Explain the design of micro program sequencer. (5)  
(b) Write a program to evaluate the following arithmetic statement  $w=(A+B*C/D)*(A*C-D)$  using 3,2,1 and zero address instructions. (5)
- 13 (a) Explain in detail about Pipelining. (5)  
(b) Explain the concept of memory interleaving and its advantages. (5)
- 14 (a) Explain in detail about DMA data transfer. (5)  
(b) Distinguish between isolated I/O and memory mapped I/O with an example. (5)
- 15 (a) Explain about RAM and ROM chips. (5)  
(b) Explain in detail about Associative Memory (5)
- 16 (a) Explain the interrupt cycle with an example. (5)  
(b) Differentiate between indirect and direct addressing modes? (5)
- 17 Write short notes on : (10)
  - (a) Array multiplier
  - (b) Serial Communication
  - (c) Page replacement

## FACULTY OF INFORMATICS

B.E. 2/4 (I.T.) I - Semester (Main) Examination, November / December 2016

Subject : Electrical Circuits and Machines

Time : 3 Hours

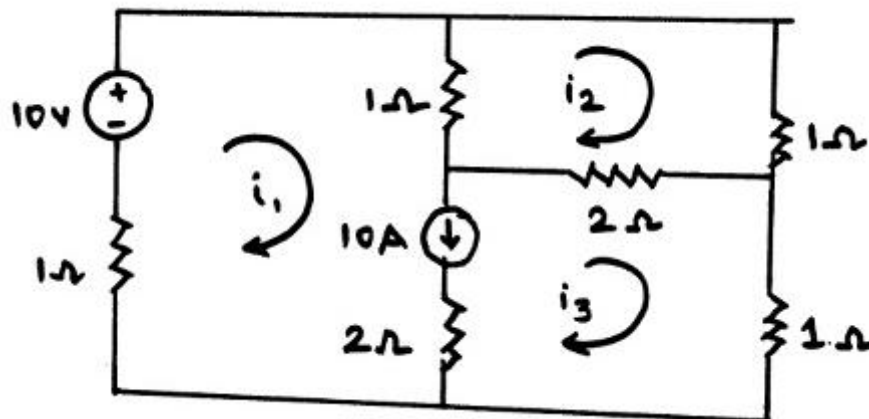
Max. Marks: 75

**Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (25 Marks)**

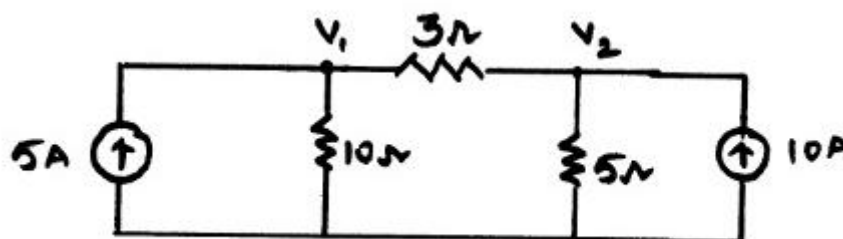
- 1 Derive expression for energy stored in capacitor. (3)
- 2 What do you mean by ideal current source? (2)
- 3 How eddy current losses are minimized in a transformer? (2)
- 4 Explain the advantages of 3-phase system. (3)
- 5 Why series motor is having high starting torque? (2)
- 6 Draw the circuit diagrams for long shunt and short shunt DC generators. (3)
- 7 Find the synchronous speed of a 8 pole, 50 Hz, 3-phase induction motor. (3)
- 8 Mention the various losses that occur in 3-phase induction motor. (2)
- 9 Differentiate BLDC motors and conventional DC motors. (3)
- 10 Mention the various types of stepper motors. (2)

**PART – B (50 Marks)**

- 11 (a) For the circuit shown below, find the branch currents  $i_1$ ,  $i_2$  and  $i_3$ . (5)



- (b) Calculate current flow in  $3\ \Omega$  resistance by using Thevenin's theorem for the circuit shown below. (5)





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- 12 A 100 V, 50Hz supply applied across the series circuit consisting of  $R = 10 \Omega$ ,  $L = 1 \text{ mH}$  and  $C = 20 \mu\text{F}$ . Calculate the impedance, current, voltage across each element, power factor, active and reactive power, also draw vector diagram. (10)
- 13 Explain the O.C. and S.C. tests conducted on transformer with help of neat circuit diagrams and also explain how circuit parameters, efficiency and regulation can be evaluated from these tests. (10)
- 14 (a) A 3 – phase 500 V motor operates at a p.f. of 0.4 lag and takes an input power of 30 kW. Two watt meters are employed to measure the input power, find the readings of watt meters. (5)  
(b) Derive the expression for relation between phase and line currents of 3-phase star connection. (5)
- 15 (a) Derive the emf equation of a DC generator. (5)  
(b) Explain the various types of excitation for the DC generators with help of neat circuit diagrams. (5)
- 16 (a) Explain the concept of rotating magnetic field in an 3-phase induction motor. (5)  
(b) Explain slip torque characteristics of an 3-phase induction motor. (5)
- 17 Explain the constructional details and principle operation of following motors with help of neat schematic diagrams.  
(a) BLDC motor (5)  
(b) Split phase motor (5)

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