

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I - Semester (Old) Examination, December 2015

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 What is meant by spheroidal weathering?
- 2 Define axial plane, hinges and axis of a fold.
- 3 Explain the difference between fault and joint.
- 4 Define the terms : aquifer, aquifuge, aquiclude and aquitard.
- 5 Name any three causes of leakages in the reservoir.
- 6 Define the terms a) Earth quake b) Tsunami
- 7 Write the values of compressive strength for the following Ferrorocks in kg/cm².
a) Granite b) Quartzite c) Marble
- 8 Explain about reservoir induced seismicity.
- 9 Discuss the methods of ground water exploration in hard rock terrain.
- 10 Explain the term RQD with suitable examples.

PART – B (50 Marks)

- 11 a) How do you recognize faults in the field?
b) Describe the various engineering properties, mineralogical composition and textural features of the following :
i) Dolerite ii) Sandstone iii) Gneiss iv) Quartzite
- 12 Give an account of
a) Causes and effects of earthquake
b) Role of water in land slide
- 13 Describe in detail the role of Engineering Geologist in planning, designing and execution of Engineering works.
- 14 Write notes on the following :
a) Types of Indian soils
b) Ground water movement
- 15 What are dams and how are they classified? Describe the geological investigations you undertake to locate a site.
- 16 Explain in detail the various geological and geophysical methods required for investigating ground water.
- 17 Write notes on the following :
a) Engineering properties of rocks
b) Geological maps, aerial photographs and Bore hole drilling

FACULTY OF ENGINEERING**B.E. 2/4 (Civil) I – Semester (New) (Main) Examination, December 2015****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 (10 x 2.5 = 25 Marks)**

- 1 Define Tunnel. Explain about over break in tunnels.
- 2 Explain in brief the terms a) Specific yield and b) Specific retention
- 3 Granites essentially composed of _____ and _____
- 4 Define axial plane, axis and hinges of the fold.
- 5 Explain about a) Intensity and b) Magnitude related with earth quakes.
- 6 What is the difference between fault and unconformity?
- 7 Define cleavage, lustre and hardness of the mineral.
- 8 What is the difference between texture and structure of the rock?
- 9 Explain various forces acting on a gravity dam.
- 10 Define Dam? Label various parts of a dam.

PART – B (50 Marks)

- 11 a) What is the difference between hanging wall and foot wall? 4
b) Describe various types of faults with neat sketches. 6
- 12 a) Define seismic waves and mention the different properties of seismic waves. 5
b) Explain the benefits of GIS in Civil Engineering. 5
- 13 Explain the investigation for the selection of a tunnel alignment in hard rock terrain. 10
- 14 Write notes on the following : 10
a) Types of Indian soils
b) Engineering classification of rock weathering
c) Mohr's scale of hardness
- 15 a) What are Aquifers? Describe different type of aquifers. 4
b) Explain the causes of land slides. 6
- 16 a) Define rock mechanism? Describe various Engineering properties of the rock. 5
b) Explain how aerial photographs are useful in Civil Engineering. 5
- 17 Describe in detail Schlumberger and Wenner methods used for locating ground water. 10

FACULTY OF ENGINEERING**B.E. 2/4 (EE/Inst.) I - Semester (Old) Examination, December 2015****Subject : Electrical Measurements and Instruments****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 | Mention the advantages of digital meters over analog meters. | 2 |
| 2 | Explain about shunt and multipliers for the extension of range of the meters. | 3 |
| 3 | Write the formula for deflecting and braking torque of energy meter. | 2 |
| 4 | Explain the creeping effect in energy meter and how to decrease it. | 3 |
| 5 | Explain the working principle of Megger. | 3 |
| 6 | List out the various types of AC bridges. | 2 |
| 7 | Draw B-H curve for the magnetic material with all the specifications. | 2 |
| 8 | How are the iron losses measured using Lloyd Fishers magnetic square? | 3 |
| 9 | Write the advantages of instrument transformer. | 2 |
| 10 | Explain the term “standardization of a potentiometer”. | 3 |

PART – B (50 Marks)

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|----|--|------------|
| 11 | With relevant diagrams explain the constructional details and working of Dynamometer Instrument and explain the scale of such an instrument. | 10 |
| 12 | Derive an equation for a 1 ϕ energy meter that number of revolutions in equal to the energy utilized. | 10 |
| 13 | Explain the following with neat diagram and principle | 5 x 2 = 10 |
| | a) Power factor meter | |
| | b) Synchro scopes | |
| 14 | a) Explain the Kelvin double bridge for measurement of low resistance. | 5 |
| | b) With a neat diagram explain Wagners earth device. | 5 |
| 15 | a) Explain how to obtain hysteresis loop by CRO. | 5 |
| | b) Explain how leakage factor is measured. | 5 |
| 16 | a) Explain the measurement of phase and frequency by Lissajous patterns. | 7 |
| | b) Write three advantages of electrostatic instrument. | 3 |
| 17 | Write a short notes on the following : | 5 x 2 = 10 |
| | a) Instrument transformers with a neat sketch | |
| | b) Calibration of ammeter and voltmeter using DC potentiometer | |

FACULTY OF ENGINEERING**B.E. 2/4 (EEE/Inst.) I – Semester (New) (Main) Examination, December 2015****Subject : Electrical Measurements and Instruments****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 accuracy, precision and uncertainty. | 3 |
| 2 | Explain about standard resistance. | 3 |
| 3 | What are the basic characteristics of measuring instruments with a moving element? | 3 |
| 4 | Explain reactive power measurement. | 3 |
| 5 | What is a Megger? | 2 |
| 6 | What is the use of frequency meter? | 2 |
| 7 | What is analog transducer? | 2 |
| 8 | What is Desauty's bridge? | 2 |
| 9 | Explain measurement of frequency by oscilloscope. | 3 |
| 10 | Define actual ratio and nominal ratio. | 2 |

PART – B (50 Marks)

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|----|---|--------|
| 11 | Explain the constructional details and working principle of electrostatic instruments. Also derive an expression for deflecting torque of electrostatic instruments. | 10 |
| 12 | a) Explain Anderson's bridge, with a neat diagram. Draw phasor diagram at balance. Derive the equation for self inductance.
b) Explain, how to obtain B-H curve using CRO. | 5
5 |
| 13 | a) Explain, construction and working principle of Wagners earthing device.
b) Explain calibration of watt meter by potentiometer with neat diagram. | 5
5 |
| 14 | What is meant by ratio and phase angle error of instrument transformer? Derive the necessary expression for these errors. | 10 |
| 15 | a) Explain the working of Weston type of synchroscope, with the help of neat diagram.
b) Distinguish between current transformer and a potential transformer. | 5
5 |
| 16 | Explain with the help of neat diagram, working of AC coordinate type potentiometer. | 10 |
| 17 | a) Explain working principle of single phase energy meter with neat diagram.
b) Explain, leakage factor with neat diagram. | 5
5 |

FACULTY OF ENGINEERING**B.E. 2/4 (ECE) I - Semester (Old) Examination, December 2015****Subject : Electronic Devices****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 Transition and Diffusion capacitances of a diode. 3
- 2 Distinguish between avalanche breakdown versus Zener breakdown. 3
- 3 Show that the $V_0 = 0.7$ volts for intrinsic Silicon if $N_A = 10 N_D$ and the doping level is such that there are 1.5 doping atoms per million of intrinsic silicon at 300K. 2
- 4 What are the advantages and disadvantages of Bridge Rectifier? 3
- 5 Mention six applications of LED and Varactor diode. 3
- 6 Define Alpha, Beta and gamma of BJT. 2
- 7 Define three stability factors and express them mathematically. 3
- 8 Distinguish between Thermistor and Sensistor. 2
- 9 Draw the symbols of BJT, JFET and enhancement, Depletion MOSFET's. 2
- 10 Define transconductance, drain resistance and amplification factors of JFET. 2

PART – B (5 x 10 = 50 Marks)

- 11 a) Derive necessary expressions for Volt-Ampere characteristics of PN junction. 5
b) Find the factor by which the reverse saturation current of silicon diode will get multiplied when the temperature is increased from 27°C to 82°C. 5
- 12 a) Compare electrical characteristics of HWR, FWR and Bridge rectifier. 5
b) Show that the ripple factor for Full Wave Rectifier with RLC filter is $\{2754 / C_1 C_2 L R_L\}$. 5
- 13 a) Draw the common emitter biasing circuit of BJT (NPN) configuration and explain how to obtain volt ampere characteristics practically. 5
b) An NPN transistor has Alpha = 0.98 $I_{CO} = 1.6 \mu A$. Transistor is used in common emitter mode with $V_{CC} = +12V$; $R_L = 4K$; what's the maximum base current required in order that transistor enters into saturation region. 5
- 14 a) Compare CB, CE and CC configurations interms of Voltage gain, current gain, input and output impedances. 5
b) Explain how to obtain graphically hybrid parameters of BJT. 5
- 15 a) Distinguish between BJT versus JFET in terms of advantages and disadvantages. 5
b) Derive necessary expressions for small signal model of BJT in terms of voltage gain, current gain, input and out impedances. 5
- 16 a) Compare enhancement MOSFET versus Depletion MOSFET. 5
b) A JFET has drain saturation current I_{DSS} of 10mA and Quiescent point drain current I_D is 5mA, with pinch off voltage -4volts. Calculate $V_{GS?}$ and gm? 5
- 17 Write short notes on : 4+3+3 = 10
a) Operating point of BJT
b) Electrostatic versus Mangetostatic Deflection
c) BJT as switch

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I - Semester (New) (Main) Examination, December 2015

Subject : Electronic Devices

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 Determine AC resistance for a semiconductor diode with a forward bias of 0.25V and I_0 at room temperature is $1.2\mu\text{A}$. 2
- 2 Draw the block diagram of power supply and explain briefly. 3
- 3 Why a bridge rectifier is preferred over Center-tap rectifier? 2
- 4 List out the advantages of h-parameters. 2
- 5 Draw the h-parameter equivalent circuit in CE configuration. 2
- 6 Derive the relation between β , α and β_{DC} of a transistor. 3
- 7 Draw the equivalent circuit of UJT. 3
- 8 What is thermal breakdown of a transistor? 2
- 9 How FET acts as a voltage variable resistor? 3
- 10 A transistor operating in CB configuration has $I_C = 2.98\text{mA}$, $I_E = 3.0\text{mA}$ and $I_{CO} = 0.01\text{mA}$. What current will flow in collector circuit of that transistor when connected in CE configuration and base current is $30\mu\text{A}$. 3

PART – B (50 Marks)

- 11 a) Derive the expression for transition capacitance C_T i.e. under reverse biased condition. 6
 b) Explain how a PN diode works under forward and reverse bias conditions. 4
- 12 a) Derive the equation of ripple factor for choke filter. 5
 b) Design a Full Wave Rectifier with inductance filter to operate at 60Hz to provide a dc output with 4% ripple for a 100 Ω load. 5
- 13 a) Derive the stability factor equation for a collector to base bias circuit. 5
 b) An NPN transistor with $\beta = 50$ is used in a common emitter circuit with resistance to collector to base. Assume $V_{BE} = 0.7\text{V}$, $V_{CC} = 10\text{V}$, $R_C = 2\text{k}\Omega$. The bias is obtained by connecting a 100 K Ω resistance from collector to base. Find the (a) Quiescent point and (b) Stability factor S. 5
- 14 a) Compare CC, CE, and CB amplifier configurations in terms of A_i , A_v , R_i and R_o ? 4
 b) Explain the construction and working operations of a Unil-junction Transistor (UJT) and plot the I-V characteristics. 6

- 15 a) Explain the construction and working of a N-channel enhancement MOSFET with drain and transfer characteristics. 7
b) Draw the small signal model of a common source JFET. 3
- 16 a) Differentiate between exact and approximate of a transistor at low frequencies. 3
b) For a CB amplifier driven by a voltage source of internal resistance $R_S = 600 \Omega$, the load impedance is $R_L = 1200 \Omega$. The h-parameters are $h_{fb} = 22$, $h_{fb} = -0.98$ and $h_{ob} = 0.25 \mu A$. Compute the current gain A_I , the input impedance R_i , voltage gain A_V and output impedance R_o . 7
- 17 Write short notes on the following : 10
a) Bridge Rectifier
b) Zener diode as a regulator
c) TRIAC

FACULTY OF ENGINEERING**B.E. 2/4 (AE) I - Semester (Old) Examination, December 2015****Subject : Automotive Electrical and Electronics****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 Explain the chemical reactions that take place in lead acid battery during discharging. | 2 |
| 2 How do you determine the efficiency of a batter? Explain. | 3 |
| 3 Explain the principle of starter motor in an automobile. | 3 |
| 4 How do you prevent headlight dazzling? Explain in brief. | 2 |
| 5 How direct current is generated in an automobile? | 3 |
| 6 Explain the process of regulating the alternator. | 2 |
| 7 Why is it required to control generator output? Explain. | 3 |
| 8 Enlist various dashboard electronic instruments. | 2 |
| 9 Explain onboard diagnostic system of an automobile. | 2 |
| 10 What is a stepped motor? Explain its usage in an automobile. | 3 |

PART – B (5 x 10 = 50 Marks)

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| 11 Explain the constant current charging method of an automobile battery with the help of a neat sketch. | 10 |
| 12 Describe the electrical circuit of head light and side lights of an automobile with the help of a neat diagram. | 10 |
| 13 Discuss the starting system and trouble diagnosis of an automobile. | 10 |
| 14 a) Explain the function of 'cutout' in charging circuit. | 5 |
| b) Describe the working of an alternative used in an automobile. | 5 |
| 15 Explain in detail about the security and warning system of an automobile. | 10 |
| 16 a) What is a sensor? Explain its role in controlling speed and throttle position. | 5 |
| b) Discuss the function of solenoid in an automobile. | 5 |
| 17 Write short notes on the following : | |
| a) Electromagnetic compatibility | 5 |
| b) Third brush regulation | 5 |

FACULTY OF ENGINEERING**B.E. 2/4 (A.E) I - Semester (New) (Main) Examination, December 2015****Subject : Automotive Electrical and Electronics****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

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|----|---|---|
| 1 | A voltage that is fluctuating or pulsating should be measures with | 3 |
| 2 | The number of amperes that the battery can deliver for 30 seconds at 0° F without cell voltages falling below 7.2 volts is called the | 3 |
| 3 | The overrunning clutch transmits cranking torque to the engine (T/F). | 3 |
| 4 | What is the self regulation in any alternator? | 3 |
| 5 | Maximum vacuum advance occurs at wide open throttle (T/F). | 3 |
| 6 | Ignition systems with electronic spark advance include an ECM that controls engine speed (T/F). | 2 |
| 7 | Detonation or Pinging results from overadvanced ignition timing (T/F). | 2 |
| 8 | What is the function of voice alert system? | 2 |
| 9 | What is automatic Head Lamp control? | 2 |
| 10 | Should Halogen Bulbs be used in Head Lamps, justify your answer. | 2 |

PART – B (50 Marks)

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|----|---|----|
| 11 | Describe briefly the various battery tests that are carried out in order to determine the state of health of the battery. | 10 |
| 12 | Describe the starter motor construction and operation and why there is a need for a starting system. | 10 |
| 13 | Which is better-Alternator mode of charging or Dynamo mode of charging and why? | 10 |
| 14 | Describe with a neat sketch a contact point ignition system. | 10 |
| 15 | Describe a high energy electronic ignition system (HEI). | 10 |
| 16 | With a neat sketch, describe multi coil distributorless ignition. | 10 |
| 17 | Write short notes on any two of the following : | 10 |
| | a) Cam shaft position sensor | |
| | b) Direct capacitor discharge ignition | |
| | c) Advantages of LED over conventional bulbs | |

FACULTY OF ENGINEERING**B.E. 2/4 (CSE) I - Semester (Old) Examination, December 2015****Subject : Computer Architecture****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

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|----|---|---|
| 1 | What are the various phases in an instruction cycle? | 2 |
| 2 | Differentiate between hardwired control and micropogrammed control. | 3 |
| 3 | Differentiate between direct address and indirect address. | 2 |
| 4 | What do you understand by memory interleaving? | 2 |
| 5 | What are the characteristics of RISC processor? | 3 |
| 6 | What is pipelining? | 2 |
| 7 | Explain synchronous Data Transfer. | 3 |
| 8 | Distinguish between isolated I/O and memory mapped I/O with an example. | 3 |
| 9 | What is hit ration? Explain. | 2 |
| 10 | Explain RAM and ROM chips. | 3 |

PART – B (50 Marks)

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|----|--|----|
| 11 | a) Explain interrupt cycle with an example. | 5 |
| | b) What is Register Transfer language? Explain. | 5 |
| 12 | a) How is the register reference instruction different from memory reference instruction? | 5 |
| | b) Explain the instruction formats with example. | 5 |
| 13 | a) Write reverse polish notation for the following :
$(A+B) * [C * [D+E] + F].$ | 5 |
| | b) Explain the different addressing modes. | 5 |
| 14 | a) Explain the process of addition using 2's complement number. | 5 |
| | b) Describe Booth's algorithm with an example. | 5 |
| 15 | a) Distinguish between programmed I/O and memory mapped I/O. | 5 |
| | b) Explain how data transfer happens in DMA. | 5 |
| 16 | a) Distinguish between write back and write through mechanism of writing data into cache memory. | 5 |
| | b) What do you understand by virtual memory? Explain. | 5 |
| 17 | Write short notes on the following : | |
| | a) Array processors | 10 |
| | b) Page replacement algorithm | |
| | c) Instruction cycle | |

FACULTY OF ENGINEERING**B.E. 2/4 (CSE) I – Semester (New) (Main) Examination, December 2015****Subject : Computer Architecture****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

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|----|--|---|
| 1 | Design a 4-bit adder of basic computer. | 3 |
| 2 | Write the microoperations for LDA and STA instructions. | 2 |
| 3 | Specify the ways of designing control unit and differentiate between them. | 3 |
| 4 | List the program control instructions. | 2 |
| 5 | What is memory interleaving? | 2 |
| 6 | Design hardware implementation for multiply operation. | 3 |
| 7 | What is burst transfer? | 2 |
| 8 | Discuss the concept of strobe signal. | 3 |
| 9 | What do you mean by page replacement algorithm? | 3 |
| 10 | What are write back and write through methods in cache memory? | 2 |

PART – B (50 Marks)

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|----|---|----|
| 11 | a) Explain the function of common bus system with a neat figure. | 5 |
| | b) Draw flow chart of instruction cycle of basic computer. | 5 |
| 12 | Explain the addressing modes with numerical example. | 10 |
| 13 | a) Explain stored program organization. | 5 |
| | b) Write a program to evaluate the arithmetic expression using 3, 2, 1 address instructions $(A+B) * (C+D)$. | 5 |
| 14 | a) Explain Booth's algorithm for multiplication. | 5 |
| | b) Discuss the pipeline technique with example. | 5 |
| 15 | a) Explain destination initiated handshaking method. | 5 |
| | b) Discuss about asynchronous serial transfer. | 5 |
| 16 | Discuss the mapping techniques of cache memory in detail. | 10 |
| 17 | Write a short notes on : | |
| | a) Memory table in virtual memory | 5 |
| | b) DMA controller | 5 |

FACULTY OF INFORMATICS**B.E. 2/4 (IT) I - Semester (Old) Examination, December 2015****Subject : Electrical Circuits and Machines****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 | Find the phasor form of the voltage
$v(t) = 155 \cos(314t - 30^\circ) \text{ V}$ | 3 |
| 2 | In a single-phase ac circuit, the voltage and current are given by $V = 220 \angle 30^\circ$,
$I = 10 \angle 0^\circ \text{ A}$. Determine the power factor. | 2 |
| 3 | What is the power in a three-phase ac circuit? | 3 |
| 4 | What are the differences between a transformer and an autotransformer? | 3 |
| 5 | What is the function of commutator and brushes in a dc motor? | 2 |
| 6 | Write the expression for the torque developed in a dc motor. | 2 |
| 7 | Explain why a single-phase induction motor is not self starting. | 3 |
| 8 | Sketch torque versus speed characteristics of a three-phase induction motor with rotor resistance control. | 3 |
| 9 | What are the applications of stepper motors? | 2 |
| 10 | How do you reverse the speed of a three-phase induction motor? | 2 |

PART – B (50 Marks)

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|-------|---|---|
| 11 a) | An electrical load of 1 KVA at 0.8 pf lagging is supplied by 220V, 50 Hz ac supply. Calculate the current. | 3 |
| b) | Calculate the capacitance of a shunt capacitor across the load to improve the overall pf to unity. | 4 |
| c) | Calculate the supply current with the capacitor and load. | 3 |
| 12 a) | Draw the phasor diagram for line voltage, phase voltage and currents in a balanced three-phase delta connected system and show their relations. | 5 |
| b) | Derive the equation for power in part(a). | 5 |
| 13 a) | Show the equivalent circuits of dc motor and dc generator. | 5 |
| b) | Derive the expression for the torque developed in a dc motor. | 5 |
| 14 a) | Obtain the per-phase equivalent circuit of a three-phase induction motor. | 6 |
| b) | A three-phase 4 pole, 60 Hz induction motor when supplied with full rated voltage runs at 1710 rpm at full load. Calculate. | 4 |
| i) | Synchronous speed | |
| ii) | Percentage slip | |
| iii) | rotor frequency in Hz. | |

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- 15 a) Explain with a neat diagram the working of a split phase single-phase induction motor. 5
b) With a neat diagram, explain the principle and working of a brushless dc motor. 5
- 16 a) Explain clearly how OC and SC tests are conducted on a transformer and what parameters are obtained from these tests. 6
b) Explain what you have understood about regulation of a transformer. 4
- 17 Write short notes on :
a) Three-phase starter 5
b) Efficiency of a transformer 5

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FACULTY OF INFORMATICS**B.E. 2/4 (IT) I – Semester (New) (Main) Examination, December 2015****Subject : Electrical Circuits and Machines****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 | Three resistors of 3 are connected in parallel, find equivalent resistance. | 3 |
| 2 | Define power factor. | 2 |
| 3 | What is the relation between the line and phase value of voltage for star connection? | 2 |
| 4 | Why the power rating of a transformer is in kVA and why its efficiency is high? | 3 |
| 5 | Draw torque vs current characteristics of DC shunt and series motor. | 3 |
| 6 | What are the various losses occurring in DC machines? | 2 |
| 7 | Differentiate 3-phase squirrel cage and slip ring induction motors. | 2 |
| 8 | Give constructional details of 3-phase induction motor. | 3 |
| 9 | What are the applications of stepper motor? | 3 |
| 10 | How does the BLDC motor differ from conventional DC motor. | 2 |

PART – B (50 Marks)

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|----|--|--------|
| 11 | a) Derive the expression for energy stored in capacitor and inductor.
b) Define form factor. | 8
2 |
| 12 | Draw circuit diagrams of OC and SC tests conducted on I-phase transformer, and explain how equivalent circuit, efficiency and regulation of transformer is evaluated. | 10 |
| 13 | a) Explain 3-phase power measurement by two-wattmeter method.
b) A balanced 3-phase delta connected load of 10 kW, line voltage and line current are 400 V and 10 A respectively. Find the circuit constants per phase for lagging pf load. | 5
5 |
| 14 | a) With the help of neat diagram, explain three point starter for a DC motor.
b) Explain production of emf in a DC generator. | 5
5 |
| 15 | a) Explain constructional details and principle operation of 3-phase induction motor.
b) Explain speed control of 3-phase induction motor. | 5
5 |
| 16 | a) Explain principle operation of capacitor start motor.
b) Explain principle operation of stepper motor. | 5
5 |
| 17 | a) A 220 V. DC shunt motor draws a line current of 2 A at light load. If armature resistance is 0.05 and field resistance is 110 , determine the efficiency of the machine running as a generator delivering a load current of 10 A.
b) State and explain Thevenin's theorem. | 5
5 |
