Code No: RT31014

R13

SET - 1

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
ENGINEERING GEOLOGY
(Civil Engineering)

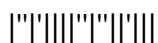Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
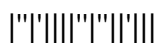3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	Define the term geology and give their importance.	[3M]
	b)	Write the physical properties of the Calcite group of minerals.	[4M]
	c)	Explain the mechanism of folding?	[4M]
	d)	What are the causes of Earthquake?	[4M]
	e)	What is the importance of radiometric method?	[4M]
	f)	What are the Effects of Tunnels?	[3M]

PART -B

2	a)	What is the scope of the Engineering Geology?	[4M]
	b)	Explain the process of Weathering in Granite.	[8M]
	c)	How to develop the valley?	[4M]
3	a)	What is meant by Rock?	[3M]
	b)	Describe the geological classification and give the characters of igneous rocks.	[8M]
	c)	What are the types of Granite?	[5M]
4	a)	What is meant by STRIKE, DIP and OUTCROP.	[7M]
	b)	What are the parts of FAULTS and give their types with sketches.	[9M]
5	a)	What is LAND SLIDES? What are the causes?	[6M]
	b)	Explain the classification of Earth movements.	[10M]
6	a)	Write the Principle of seismic method of prospecting.	[8M]
	b)	Write the principle, parameters, methods and their applications of magnetic method.	[8M]
7	a)	What are the purposes of Dams?	[6M]
	b)	Explain the geological considerations for successful construction of dams in view of rocks, structures and ground water point of view with sketches.	[10M]

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SET - 2

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
ENGINEERING GEOLOGY
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	What are the branches of geology?	[3M]
	b)	Draw the Structures of metamorphic rocks.	[4M]
	c)	What is Fault plane?	[3M]
	d)	What are causes of Landslides?	[4M]
	e)	What is Well logging?	[4M]
	f)	What kinds of rocks are suitable for constructions for tunnels? Explain	[4M]

PART -B

2	a)	Define the terms weathering, erosion.	[4M]
	b)	Explain the physical factors in the process of weathering.	[8M]
	c)	What is the role of atmosphere in weathering?	[4M]
3	a)	Define the term mineral. What kind of material is called mineral?	[3M]
	b)	Write the importance of different physical properties in mineral identification.	[8M]
	c)	What is importance of Garnet and give their physical properties.	[5M]
4	a)	What are the parts of FOLDS**?**	[6M]
	b)	Draw the types of folds and give their mechanism with sketches.	[10M]
5	a)	Explain the terminology of Earthquakes.	[6M]
	b)	Explain the preventive measures for constructions of buildings in Earthquake prone areas.	[10M]
6	a)	What are the branches of geophysics?	[8M]
	b)	Write the factors are influencing electrical Resistivity and give their, classification. .	[8M]
7	a)	Explain the water tightness of the reservoir.	[8M]
	b)	What are the associated rock types are influenced by Reservoirs. Explain with sketches.	[8M]

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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
ENGINEERING GEOLOGY
(Civil Engineering)

Time: 3 hours   Max. Marks: 70

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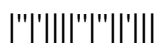3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	What is structural geology? Give their importance in civil engineering.	[3M]
	b)	What are the structures of igneous rocks?	[4M]
	c)	Define the terms of parts of folds.	[4M]
	d)	What are the types of soils under zone of saturation?	[4M]
	e)	What are the factors influencing seismic wave velocities?	[4M]
	f)	Write about Lining of tunnels.	[3M]

PART -B

2	a)	What are the geological agents? Explain.	[4M]
	b)	Explain the geological work of River Erosion, transport, deposition.	[8M]
	c)	Explain the stages of the development of the river.	[4M]
3	a)	What kind of minerals occurs abundantly on the surface of the earth?	[3M]
	b)	What are the various types of forms in minerals?	[8M]
	c)	Explain the mode of formation of minerals.	[5M]
4	a)	What are the parts of joints and give their classification.	[8M]
	b)	What are the parts of unconformity? Give their classification.	[8M]
5	a)	What is Water table? Give their types of water. Write about under zone of aeration.	[8M]
	b)	Define the term porosity, permeability. Classify the rocks based on porosity, permeability.	[8M]
6	a)	Write the importance of geophysical investigation	[8M]
	b)	Enumerate the classification of geophysical methods.	[8M]
7	a)	What id Purposes of tunnels.	[7M]
	b)	Explain the influences of the associated geological structures for tunneling.	[9M]

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ENGINEERING GEOLOGY
(Civil Engineering)

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2. Answering the question in **Part-A** is compulsory
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PART –A

1	a)	What is physical geology? Give their civil engineering importance.	[3M]
	b)	What are the structures of sedimentary rocks?	[4M]
	c)	Draw the open and closed folds.	[4M]
	d)	What are types of soils?	[4M]
	e)	What are principles of Exploration Geophysics?	[4M]
	f)	What is OVER BREAK?	[3M]

PART -B

2	a)	What are the allied branches?	[4M]
	b)	Explain the role of importance of geology in civil engineering.	[8M]
	c)	What are peninsular rivers?	[4M]
3	a)	Write the common rock forming minerals with examples.	[3M]
	b)	Write the physical properties, uses of the following minerals **A. Microclane Feldspar B.Amethyst.**	[8M]
	c)	What is **FRACTURE**? Give their types.	[5M]
4	a)	What is anticline, syncline? Give best examples in features on the earth.	[7M]
	b)	What are conformable beds? Explain the types of Conformity.	[9M]
5	a)	Write the controls of groundwater movement.	[6M]
	b)	What are the methods using for ground water Exploration techniques?	[10M]
6	a)	What are the branches of geophysics?	[8M]
	b)	Write the physical property, principle, parameters and equipments in Gravity methods.	[8M]
7	a)	What are the effects of tunnels?	[6M]
	b)	What is the influence of ground water conditions for successful tunnels?	[10M]

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R13

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
ELECTRICAL MACHINES – III
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
(Provide normal graph sheets)

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PART –A

1	a)	Why power factor of a single phase induction motor is low?	[3M]
	b)	What is the role of damper winding in (**i**) alternator and (**ii**) synchronous motor?	[4M]
	c)	Why does synchronous impedance method give a poor voltage regulation?	[4M]
	d)	Why alternators are operated in parallel?	[3M]
	e)	What could be the reasons if a 3-phase synchronous motor fails to start?	[4M]
	f)	What are the effects of hunting on a synchronous motor?	[4M]

PART -B

2 a) Describe double revolving field theory as applied to single phase induction motor. [9M]
   b) Why single phase induction motors are not self starting? How it can be started. [7M]

3 a) Derive an expression for induced E.M.F per phase in a three phase alternator? Mention how different winding factors affect the induced e.m.f ? [8M]
   b) A 4 pole, 3-phase, 50 Hz, star connected alternator has 60 slots with 4 conductors per slot. Coils are short pitched by 3 slots. If the phase spread is 60^0, find the line voltage induced for a flux per pole of 0.0943 Wb distributed sinusoidally in space. All the turns in phase are in series. [8M]

4 a) Explain the Potier triangle method of finding the voltage regulation of an alternator. [8M]
   b) A 100 kVA, 3000V, 50Hz 3-phase star connected alternator has effective armature resistance of 0.2 ohms. The field current of 40 A produce short-circuit current of 200 A and an open circuit e.m.f of 1040 V (line). Calculate the full load voltage regulation at 0.8 lagging and 0.8 leading power factors. Draw phasor diagrams. [8M]

5 a) Show that in order to obtain a constant voltage, constant frequency of a practical bus bar system, the number of alternators connected in parallel should be as large as possible. [8M]
   b) Two 3-ph alternators are working in parallel with the following particulars: [8M]
   Alternator 1: $Z_1 = (0.2+j2)$ ohms/ph; $E_1 = (2000+j0)$ V/ph
   Alternator 2: $Z_2 = (0.2+j2)$ ohms/ph; $E_2 = (2200+j100)$ V/ph
   Load: $Z_L = (3+j4)$ ohms/ph. Determine the kW output and power factor of each alternator.

6 a) Describe the effect of varying excitation upon armature current and power factor of synchronous motor when the input power to motor is maintained constant. [8M]
   b) A sub-station operating at full load of 1200 kVA supplies a load at 0.7 power factor lagging. Calculate the permissible additional load at this power factor and the rating of synchronous condenser to raise the substation power to 0.9 lagging [8M]

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7 a) Show that the locus of stator current for a constant output of 3-phase synchronous   [9M]
     motor connected to a constant voltage, constant frequency bus-bars is a circle?

   b) Explain the construction of damper winding. Clearly show the location of damper   [7M]
     winding.

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Code No: RT31024

R13

SET - 2

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
ELECTRICAL MACHINES – III
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
(Provide normal graph sheets)

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PART –A

1 a) Why single phase induction motor does not develop a starting torque?   [3M]
   b) What is meant by armature reaction in an alternator?   [4M]
   c) Why voltage regulation of an alternator is negative for leading power factor?   [4M]
   d) What is the effect of varying excitation of an alternator running in parallel with   [4M]
       another alternator?
   e) What is meant synchronous condenser? What are its properties?   [4M]
   f) What are the functions of damper winding in synchronous motor?   [3M]

PART -B

2   Show that a single phase winding when excited by a single phase supply produce   [16M]
       two equal and opposite revolving fields.

3 a) Discuss the differences between distributed and concentrated windings of   [8M]
       synchronous machines?
   b) A 3-phase, star connected, 8 pole, 750 rpm alternator has 72 slots on its periphery. [8M]
       Each slot has 12 conductors and the winding is short pitched by 2 slots. Find the
       pitch factor and distribution factor. Also, calculate the induced e.m.f between lines if
       the flux of 0.04wb is distributed sinusoidally. All the conductors in phase are
       connected in series

4 a) Explain synchronous impedance method to determine voltage regulation of an   [8M]
       alternator.
   b) A 3-phase, star connected salient pole synchronous generator is driven at a speed   [8M]
       near synchronous with the field circuit open and the stator is supplied from a
       balanced 3-phase supply. Voltmeter connected across the line gave minimum and
       maximum readings of 1196 V and 1217 V. The line current fluctuated between 120
       A and 225 A. Find the direct and quadrature axis reactance per phase. Neglect
       armature resistances

5 a) What is the need for parallel operation of alternators? Explain the division of load [8M]
       between two parallel alternators
   b) Two alternators X and Y operate in parallel and supply a load of 10 MW at 0.8 p.f.   [8M]
       lagging.
       (**i**) By adjusting steam supply of X, its power output is adjusted to 6000 kW and by
           changing its excitation, its p.f. is adjusted to 0.92 lag. Find the p.f. of alternator
           Y.
       (**ii**) If steam supply of both machines is left unchanged, but excitation of Y is
           reduced so that its p.f. becomes 0.92 lead, find new p.f. of X

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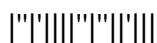
6 a) Explain the construction and operating principle of synchronous motor. Show the region of region of operation of the condenser on V-curves   [8M]
   b) Draw the phasor diagram of 3-phase synchronous motor. Explain the effect of (**i**) change in excitation if load is constant (**ii**) change of load if excitation is constant.   [8M]

7 a) Why synchronous motor is not a self starting? Explain the starting methods of synchronous motors?   [8M]
   b) Show that locus of power of a synchronous machine is circle? Give the co-ordinates of power circle.   [8M]
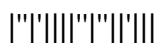
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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
ELECTRICAL MACHINES – III
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
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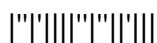**(Provide normal graph sheets)**
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PART –A

1 a) Write the advantages of AC series motor. [3M]
   b) Why are salient pole alternators more suitable for low speed and non-salient pole alternators for high speed operation? [4M]
   c) Two reaction theory is applied only to salient pole machines. State the reasons. [4M]
   d) How can the distribution of load between two alternators operating in parallel be varied? [4M]
   e) Why a 3-phase synchronous motor will always run at synchronous speed? [3M]
   f) How the starting current limited in case of a synchronous motor provided with a damper winding? [4M]

PART -B

2 a) Explain the principle of operation and constructional features of a single phase induction motor. [8M]
   b) Explain the phasor diagram and characteristics of AC series motor. [8M]

3 a) Define pitch factor and distribution factor and derive expressions to compute these factors. [6M]
   b) Calculate the pitch factor and distribution factors for a 3-ph winding with 4 slots per pole per phase and with the coil span of 10 slots. [4M]
   c) What is armature reaction? Explain the effect of armature reaction in alternators? [6M]

4 a) Explain how X_d and X_q of a salient pole alternator can be found experimentally. [8M]
   b) A 3-phase, 200 kVA, 1.1 kV, 50 Hz star connected alternator having an effective per phase resistance of 0.62 ohms gave the following results: [8M]

   Filed current (A)   : 20   35   50   80   100   120
   Open circuit Voltage (V) : 692.82 1120 1450 1750 1953 2180
   Short circuit current (A)   : 0
   Using MMF method, find voltage regulation at 100 A (**i**) 0.8 lagging (**ii**) 0.8 leading power factors.

5 a) What are the effects of change of excitation and mechanical power input on alternators operated in parallel. [8M]
   b) A 2 MVA, 3-phase, star connected, 4 pole, 750 rpm alternator is operating on 6000 V bus bars. The synchronous reactance is 6 ohms per phase. Find synchronizing power and torque for full load 0.8 power factor lagging. [8M]

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6 a) Derive the expression for the maximum power developed by a synchronous motor.   [8M]
   b) A 3-phase star connected 440 V; the synchronous motor takes a power input of 5 kW   [8M]
      at rated voltage. Its synchronous reactance is 5 ohms per phase and resistance is
      negligible. If its excitation voltage is adjusted equal to rated voltage of 400V, compute
      the load angle, power factor and armature current.

7 a) What is meant by hunting? Explain the methods to suppress hunting.   [7M]
   b) Explain why a Synchronous motor is not self-starting. Briefly explain the following   [9M]
      starting methods in detail (**i**) Auxiliary motor starting (**ii**) Induction motor starting.

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SET - 4

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
ELECTRICAL MACHINES – III
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 70

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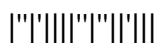3. Answer any **THREE** Questions from **Part-B**
(**Provide normal graph sheets**)

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PART –A

1 a) State the principle of double-field revolving theory?   [3M]
  b) Write the advantages and disadvantages of short pitched windings.   [4M]
  c) What are the effects on voltage regulation of an alternator of power factors   [4M]
      (**i**) at lagging power factor (**ii**) at leading power factor?
  d) A machine with a large air gap has a higher synchronizing power. Why?   [4M]
  e) What are the effects of increase in excitation of a synchronous motor?   [4M]
  f) How is the hunting avoided in a synchronous motor?   [3M]

PART -B

2 a) Discuss the principle of operation of AC series motor. Also list their applications.   [8M]
  b) Derive equation for forward slip and backward slip of a single phase induction motor.   [8M]

3 a) With neat diagrams, explain the constructional features of salient pole and non-salient   [8M]
      pole synchronous machines.
  b) Explain about distributed and concentrated windings in synchronous machines?   [4M]
  c) Distinguish between integral slot and fractional slot windings and their merits and   [4M]
      demerits

4 a) A 5 kVA, 220 V, star connected three phase salient pole alternator with direct axis and   [8M]
      quadratic axis reactances of 12 ohms and 7 ohms respectively, delivers full load
      current unity power factor. Calculate the excitation voltage. Neglect armature
      resistance
  b) Explain the ampere-turn method for the determination of voltage regulation of an   [8M]
      alternator

5 a) What are the conditions required for parallel operation of alternators? Discuss any one
      method of synchronizing of alternators? Also explain the advantages of parallel
      operation of alternators.
  b) A 3-phase, 3000 kVA, 6-pole, 50 Hz alternator running in parallel with 3300 V bus-   [8M]
      bar. Z_s=25% Calculate synchronous power and torque for one mechanical degree of
      displacement.

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6 a) Draw and explain the phasor diagram of 3-phase synchronous motor when (**i**) it is over excited (**ii**) it is under excited. [8M]

   b) A 2 kV, 3-phase star-connected synchronous motor has an effective resistance and synchronous reactance per phase of 0.3 ohms and 2.4 ohms respectively. The input is 800 kW at normal voltage and induced line e.m.f is 2500 V. Calculate line current and power factor. [8M]

7 a) What is meant by excitation circle? Explain construction of excitation circle for a synchronous motor. [8M]

   b) Explain the operation and characteristics of synchronous induction motor. [8M]
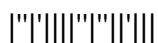
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R13

SET - 1

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
INSTRUMENTATION & CONTROL SYSTEMS
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1 a) How errors are classified? Enumerate the various sources of errors.   [3M]
   b) Describe the constructional details, theory and application of different types of   [4M]
       Diaphragm pressure gauges
   c) Write explanatory notes on Hot-wire anemometers   [4M]
   d) Define strain Rosette. How it is used for strain measurement?   [4M]
   e) Explain the working of proving ring with a neat sketch   [4M]
   f) Differentiate Open and closed loop control systems with a suitable examples.   [3M]

PART -B

2 a) Sketch and explain with a block diagram generalized measurement system and it   [6M]
       elements with an example.
   b) Explain the following terms. **i**) Range and span **ii**) Resolution **iii**) Calibration **iv** [4M]
       Sensitivity
   c) Explain the basic principal of working of piezo-electric transducers   [6M]

3 a) What do you mean by low pressures? List out various indirect methods fo   [8M]
       measurement of low pressure and explain any two methods.
       b) Explain the disappearing filament pyrometers setup and explain its operation   [4M]

       c)Explain any two temperature measurement equipments with neat sketches   [4M]

4 a) Write short notes on cryogenic fuel level indicator   [4M]
   b) Why rotameter is called variable area flow meter? Describe its construction and   [6M]
       working with a neat sketch.
   c) Explain the construction, principle of working and advantages of Capacitive   [6M]
       vibration sensor.

5 a) Derive, from the first principles, the relationship for gauge factor of a strain gauge. [8M]
   b) Describe the tension measurement using strain gauge with neat sketch.   [8M]

6 a) With a neat sketch, explain the working of fluid friction dynamometer.   [8M]
   b) Explain construction and working of hydraulic load cell.   [8M]

7 a) Explain in detail about different types of control actions and their effect on system [8M]
       performance?
   b) Draw a block diagram of closed loop control system. Describe its working for   [8M]
       motor speed control.

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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
INSTRUMENTATION & CONTROL SYSTEMS
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
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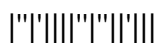3. Answer any **THREE** Questions from **Part-B**

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PART –A

1 a) Explain the following terms **i**) Speed of response **ii**) Measuring lag **iii**) Fidelity **iv**) Dynamic error   [3M]
   b) Classify temperature measuring instruments. Write short notes on solid expansion thermometers   [4M]
   c) Explain any with a neat sketch any of the constant head variable area flow meter.   [4M]
   d) List various strain gauge circuitry used for the measurement of strain with neat sketches   [4M]
   e) Define the following terms **i**) Humidity **ii**) Absolute humidity **iii**) Relative Humidity **iv**) Specific humidity   [4M]
   f) Differentiate a feed back and non-feed back control system   [3M]

PART -B

2 a) How errors are classified? Explain how errors can be reduced.   [4M]
   b) Sketch and explain Linear Variable Differential Transformer with a neat sketch   [6M]
   c) Sketch and explain Photo electric transducer.   [6M]

3 a) Explain working principle of thermocouples   [4M]
   b) Explain the working principle of McLeod pressure gauge. State advantages and disadvantages of McLeod pressure gauge   [8M]
   c) Classify pressure measurement techniques   [4M]

4 a) Write short notes on non contact type tachometers   [3M]
   b) With the help of hot wire bridge circuit explain the working of hot wire anemometer in constant current mode and constant temperature mode.   [7M]
   c) Explain the construction, principle of working and advantages of Strain gauge accelerometer.   [6M]

5 a) Explain any two methods of compensating temperatures for electrical resistance strain gauge.   [8M]
   b) Derive, from the first principles, the relationship for gauge factor of a strain gauge.   [8M]

6 a) Explain the following i) Hydraulic load cell ii) Strain gauge load cell   [8M]
   b) Explain any two torque measuring techniques with neat sketches   [8M]

7 a) Summarize the essential features of open-loop and closed-loop control systems. Illustrate your answer by referring to a particular example of each type of system, and sketch its relevant block diagram. Point out the disadvantages of open-loop systems.   [8M]
   b) How feedback control system is applied for temperature control of air conditioned system   [8M]
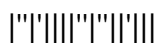
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SET - 3

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
INSTRUMENTATION & CONTROL SYSTEMS
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1 a) Explain the following terms. **i**) Accuracy **ii**) Precision **iii**) Threshold **iv**) Standards [4M]

b) Explain with a neat sketch how pressure can be measured with bourdon tube pressure gauge. [4M]

c) Define vibration. Explain how it is characterized, and list some of its harmful effects. [3M]

d) What are the requirements of materials for strain gauges? [3M]

e) Explain with a neat sketch Electrical torsion meter [4M]

f) How feedback control system is applied for temperature control of boiler [4M]

PART -B

2 a) Sketch and explain with a block diagram generalized measurement system and its elements with an example. [6M]

b) Sketch and explain variable capacitive transducer elements with applications. [6M]

c) Write short notes on calibration procedures for transducers [4M]

3 a) Explain the working of liquid in glass thermometers by means of neat sketch. List their advantages and disadvantages. [6M]

b) Explain **i**) Gauge pressure **ii**) Absolute pressure [2M]

c) Explain the following vacuum gauges **i**) Thermocouple type thermal conductivity gauge and **ii**) Pirani gauge [8M]

4 a) Write short notes on bubler level indicators [3M]

b) Why rotameter is called variable area flow meter? Describe its construction and working with a neat sketch. [8M]

c) Explain the construction, principle of working and advantages of Seismic instruments. [5M]

5 a) With the help of suitable diagrams, derive the expressions for quarter bridge and half bridge circuits of Wheatstone bridge used for stain measurement. Give applications of each. [8M]

b) Define Strain Rosette. How it is used for strain measurement? [4M]

c) Name the various types of strain gauges for different applications [4M]

6 a) Explain resistive hygrometer for the measurement of humidity with a neat sketch [4M]

b) Explain with a neat sketch Strain gauge load cell for measurement of force [6M]

c) Explain water vortex dynamometer with a neat sketch [6M]

7 a) What is a 'control system'? Enumerate and define the elements of a control system. [8M]

b) Differentiate Open and closed loop control systems with a suitable examples. [8M]

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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
INSTRUMENTATION & CONTROL SYSTEMS
(Mechanical Engineering)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
　　　 2. Answering the question in **Part-A** is compulsory
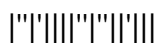　　　 3. Answer any **THREE** Questions from **Part-B**
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PART –A

1 a) Explain with a block diagram generalized measurement system and its elements with an example. [4M]

　b) Explain with a neat sketch working of Thermocouple type thermal conductivity gauge. [4M]

　c) Write short notes on mechanical and electrical tachometers [3M]

　d) Define strain Rosette. How it is used for strain measurement? [4M]

　e) Explain resistive hygrometer for the measurement of humidity with a neat sketch [4M]

　f) Explain the basic features of an open loop control system with a block diagram [3M]

PART -B

2 a) Explain the following terms. **i**) Accuracy **ii**) Precision **iii**) Calibration **iv**) Standards [4M]

　b) Explain in brief the various sources of errors and how can they be reduced [6M]

　c) Explain the working principle of Ionization gauge with a neat sketch. State its advantages and disadvantages [6M]

3 a) Explain the disappearing filament pyrometers setup and explain its operation [8M]

　b) What are the advantages of thermistors for temperature measurement? [3M]

　c) Explain with a neat sketch working of Bourdon tube pressure gauge. List its advantages and disadvantages. [5M]

4 a) With the help of hot wire bridge circuit explain the working of hot wire anemometer in constant current mode and constant temperature mode. [8M]

　b) Name the different vibration sensing system used in practice. Explain any one such system for the measurement of vibration. [8M]

5 a) Derive, from the first principles, the relationship for gauge factor of a strain gauge. [8M]

　b) What is temperature compensation and how it is achieved when using bonded strain gauge for the measurement of axial thrust, bending loads and torque? [8M]

6 a) Define the following terms **i**) Humidity **ii**) Absolute humidity **iii**) Relative Humidity **iv**) Specific humidity [4M]

　b) Explain the working of optical torsion meter for the measurement of torque with a neat sketch. [6M]

　c) Sketch and explain any two shaft power measuring devices. [6M]

7 a) Describe a control system to fill a tank with water after it is emptied through an output at the bottom. This system automatically stops the inflow of water when the tank is filled. Draw the block diagram of the system. [8M]

　b) Explain in detail about different types of control actions and their effect on system performance? [8M]
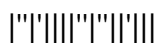
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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
DIGITAL SYSTEM DESIGN & DIGITAL IC APPLICATIONS
(Comm to ECE and EIE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A**is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1 a) Write short note VHDL requirements. [3M]
  b) Explain about pull gates VHDL modeling. [4M]
  c) How a 2-to-4 decoder can be realized using ROM? [3M]
  d) Draw the schematic diagram of a tri-state buffer and explain its operation. [4M]
  e) Write a VHDL code for a 4 bit up counter [4M]
  f) Compare latches and flip flops. [4M]

PART -B

2 a) What are the different data objects supported by VHDL? Explain scalar types with suitable examples. [8M]
  b) Write a VHDL Entity and Architecture for the following function. [8M]
     F = a (XOR) b (XOR)c, Also draw the relevant logic diagram.

3 a) When is a label required for a block? [3M]
  b) Explain the Functional Gate-Level verification with example. [8M]
  c) How does the case statement duffer from the case statement? [5M]

4 a) What is the minimum size of a Read Only Memory to realize a binary multiplier of two 4-bit unsigned numbers? [8M]
  b) Compare and contrast commercially available Read only memories, PROM, EPROM and EEPROM. [8M]

5 a) Discuss about dynamic electrical behavior. [8M]
  b) Mention about the merits and demerits of ECL gate [8M]

6 a) Discuss about the implementation of comparator using digital IC. [8M]
  b) Explain about the Dual Priority Encoder with neat diagram. [8M]

7 a) Discuss about the working of Johnson Counter using 74 LS194. [8M]
  b) Write a VHDL program to simulate the behavior of a positive edge triggered 'D' flip – flop. [8M]

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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
DIGITAL SYSTEM DESIGN & DIGITAL IC APPLICATIONS
(Comm to ECE and EIE)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
       2. Answering the question in **Part-A** is compulsory
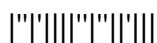   3. Answer any **THREE** Questions from **Part-B**
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PART –A

1	a)	Explain about the Objects and Classes.	[3M]
	b)	Write shot note on Functional Gate-Level verification.	[4M]
	c)	Explain briefly Static RAM Internal structure.	[3M]
	d)	Draw the circuit for CMOS OR-AND-Invert logic gates.	[4M]
	e)	Design a full adder using two half adders. Write its structural code.	[4M]
	f)	Discuss the steps involved in the analysis of sequential circuits.	[4M]

PART -B

2	a)	What statement is primarily used to describe a design in dataflow style?	[4M]
	b)	What is the purpose of the 'timescale' compiler derivative? Give an example.	[8M]
	c)	What is wrong with the following continuous assignment?	[4M]

assign reset = #2 ^ hwrite_bus;

3	a)	Explain the difference between function and procedure supported by VHDL. Give the necessary examples.	[9M]
	b)	Explain data-low design elements of VHDL.	[7M]

4	a)	Explain the operation of Synchronous SRAM with the help of its internal architecture.	[8M]
	b)	Explain the design procedure of 4x4 binary multiplexer using 256x8 ROM	[8M]

5	a)	Write about the totem pole arrangement in case of TTL family.	[8M]
	b)	Differentiate between the TTL and DTL logic families.	[8M]

6		Design 8 bit ALU using digital ICs.	[16]

7		Design a 4 bit synchronous binary even counter and write its behavioural model.	[16]
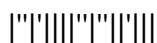
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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
DIGITAL SYSTEM DESIGN & DIGITAL IC APPLICATIONS
(Comm to ECE and EIE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	Write short note on package declaration.	[3M]
	b)	Comparison of VHDL and Verilog HDL.	[4M]
	c)	What are the different register types in VHDL?	[3M]
	d)	Explain about CMOS steady state electrical behavior.	[4M]
	e)	Draw the truth table and circuit diagram of a 2-to-4 decoder.	[4M]
	f)	Write a short note on Programmable Array Logic Devices.	[4M]

PART -B

2	a)	Write a short note on Elements of VHDL.	[4M]
	b)	What is the use of packages and libraries in VHDL? Explain with examples.	[12M]

3	a)	Draw the logic diagram of simple 8x4 diode ROM and explain its function.	[8M]
	b)	Explain the DRAM read and write cycle timings with help of waveforms.	[8M]

4	a)	With the block diagram of output buffer control portion of an SRAM to describe bi-directional data transfer operations in SRAM.	[8M]
	b)	With the help of timing waveforms, explain read and write operations of DRAM.	[8M]

5	a)	Design 2-input LS-TTL NAND gate and explain its operation. Give the function table, truth table.	[8M]
	b)	Compare CMOS, TTL and ECL with reference to logic levels, DC noise margin, propagation delay and fan-out.	[8M]

6	a)	Design the logic circuit and write a data-flow style VHDL program for the following functions? $F(X) = \sum A,B,C,D(0,1,3,5,14) + d(8,15)$	[8M]
	b)	Write a data-flow style VHDL program for 4:1 MUX.	[8M]

7	a)	Design a self-correcting 4-bit, 4-state ring counter with a single circulating 0 using IC 74LS194.	[8M]
	b)	Explain the different Modes of Operation of Shift Registers.	[8M]

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SET - 4

III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
DIGITAL SYSTEM DESIGN & DIGITAL IC APPLICATIONS
(Comm to ECE and EIE)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	Write a syntax of VHDL array declaration.	[3M]
	b)	Write note onConcurrent and Sequential Statements.	[4M]
	c)	Explain different Commercial ROM types.	[3M]
	d)	What are the salient features of TTL logic family?	[4M]
	e)	Write a VHDL code to simulate a full adder circuit.	[4M]
	f)	Write Modes of Operation of Shift Registers.	[4M]

PART –B

2	a)	Explain the terms entity, is, port, in, out and end pertaining to VHDL complier.	[8M]
	b)	Write a VHDL program using all the above terms and explain the same.	[8M]
3	a)	Explain the difference between VHDL program structure and other procedural language program structure.	[8M]
	b)	Write a VHDL program to detect prime number of a 8-bit input.	[8M]
4	a)	List out various types of Read-Only-Memories that are commercially available. Describe the functionality and limitations of each type.	[8M]
	b)	Draw the timing diagram to specify typical timing parameters of an SRAM to perform write operation.	[8M]
5	a)	Write about the TTL to CMOS interfacing.	[8M]
	b)	Discuss about the fastest logic family and mention the typical values of its various parameters.	[8M]
6	a)	Write the disadvantages in implementation of N-bit binary adder using full adders.	[5M]
	b)	Explain the working of carry look ahead adder and its advantages.	[11M]
7	a)	Write a VHDL program to design a modulo-6 counter	[12M]
	b)	Write the differences between flip-flop and latch.	[4M]
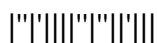
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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
DATABASE MANAGEMENT SYSTEMS
(Common to CSE and IT)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
        2. Answering the question in **Part-A** is compulsory
   3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	Differentiate between schema and instance.	[4M]
	b)	What is the importance of handling null values in a relation?	[4M]
	c)	List SQL grouping functions with examples.	[4M]
	d)	Describe lossless join decomposition.	[3M]
	e)	State and explain two-phase locking protocol.	[4M]
	f)	What is multilevel indexing?	[3M]

PART –B

2	a)	Describe the characteristics of a database system.	[4M]
	b)	Draw and explain three-tier schema architecture of database system.	[8M]
	c)	Present any two database applications by describing their features.	[4M]
3	a)	What is a relation? Describe the characteristics of a relation.	[6M]
	b)	Discuss the importance of entity integrity and referential integrity constraints.	[5M]
	c)	What is relation schema and state?	[5M]
4	a)	What is ER model? Explain its concepts.	[10M]
	b)	Distinguish between independent and correlated nested queries. Provide appropriate examples to support your explanation.	[6M]
5	a)	Why normalization is needed? Explain the process of normalization.	[8M]
	b)	Explain the role of functional dependencies in normalization with suitable examples.	[8M]
6	a)	What is transaction? Mention the desirable properties of a transaction.	[6M]
	b)	Discuss about transaction recovery techniques.	[10M]
7	a)	Mention various types of records. Describe how they are organized inside a file?	[8M]
	b)	What is an index? Explain its role in improving database access.	[8M]

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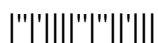
III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
DATABASE MANAGEMENT SYSTEMS
(Common to CSE and IT)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
　　　 2. Answering the question in **Part-A** is compulsory
　　　 3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What is Data independence?	[3M]
	b)	Write and describe the structure of SQL SELECT statement.	[4M]
	c)	Describe entities and relationships with examples.	[4M]
	d)	Define surrogate key and specify an example of it.	[3M]
	e)	What is transaction log? Mention its content.	[4M]
	f)	Describe the structure of a node in B-tree .	[4M]

PART –B

2	a)	What do you mean by environment in database systems? Explain with the help of database system structures.	[8M]
	b)	Explain the client - server architecture of a DBMS.	[8M]
3	a)	By considering suitable examples, describe the usage of SQL CREATE and ALTER statements.	[8M]
	b)	What is DML? Explain DML operations with examples.	[8M]
4	a)	Write about different types of attributes in ER model. Show the notation of each.	[4M]
	b)	What is a weak entity type? How to model it? Explain with suitable example.	[4M]
	c)	What is a view? How to specify a view? Write about view implementation techniques.	[8M]
5	a)	What is a normal form? Explain about various normal forms with examples.	[10M]
	b)	List and explain the inference rules of functional dependencies.	[6M]
6	a)	Why concurrency control is needed? Explain the problems that would arise when concurrency control is not provided by the database system.	[9M]
	b)	What is serialization? Explain it.	[7M]
7	a)	Compare and contrast between heap files and sorted files.	[8M]
	b)	Define dynamic multilevel indexing how to implement it with the help of B+ trees? Explain.	[8M]

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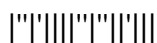
III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
DATABASE MANAGEMENT SYSTEMS
(Common to CSE and IT)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What are the responsibilities of DBA?	[3M]
	b)	Show how data integrity can be guaranteed by using different database constraints.	[4M]
	c)	Illustrate the implementation of equi-join and outer joins in SQL.	[4M]
	d)	Explain the need of schema refinement.	[3M]
	e)	What is a database trigger? Give an example of trigger definition.	[4M]
	f)	Differentiate between spanned and unspanned records.	[4M]

PART –B

2	a)	Mention various groups of database users. Explain about their roles in detail.	[8M]
	b)	What is a data model? Describe various data models.	[8M]
3	a)	With the aid of relevant examples illustrate different DDL statements supported by SQL.	[8M]
	b)	What is SQL single row function? By means of suitable examples illustrate the usage of SQL date, character and number functions.	[8M]
4	a)	Explain in detail about inheritance, specialization and generalization using ER diagrams.	[12M]
	b)	List and explain aggregate functions used in SQL with examples.	[4M]
5	a)	What is multi valued dependency? Illustrate 4NF with an example.	[6M]
	b)	What is minimal cover / irreducible set of functional dependencies? Write and explain the steps of the algorithm used for finding minimal cover. Consider an example set of FDs and trace the algorithm.	[10M]
6	a)	Write about the transaction management with SQL using commit, rollback, and savepoint.	[6M]
	b)	Briefly discuss about various lock based mechanisms used in concurrency control.	[10M]
7	a)	Discuss in detail about different file operations.	[8M]
	b)	By means of an example, show how to determine the order of a B-Tree.	[8M]

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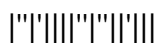
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III B. Tech I Semester Regular/Supplementary Examinations, October/November - 2016
DATABASE MANAGEMENT SYSTEMS
(Common to CSE and IT)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
        2. Answering the question in **Part-A** is compulsory
   3. Answer any **THREE** Questions from **Part-B**
*****

PART –A

1	a)	What is Database system? Give any four features that a database system should provide to its users.	[4M]
	b)	Define domain, attribute, tuple and relation.	[3M]
	c)	Differentiate specialization and generalization.	[4M]
	d)	By means of an example show how BCNF is stronger than 3NF.	[3M]
	e)	Explain Grant and Revoke commands with examples.	[4M]
	f)	What is hashing? Explain it briefly.	[4M]

PART –B

2	a)	Distinguish between centralized and client-server architectures of a database system.	[8M]
	b)	Differentiate between File system and Database System.	[8M]
3	a)	Write in detail about different types of constraints that can be specified on a relation.	[8M]
	b)	What is the difference between DELETE, TRUNCATE and DROP statements in SQL?	[4M]
	c)	Discuss about SQL data types.	[4M]
4	a)	With the aid of appropriate examples, describe how to model the following in ER model: i) Entity type ii) Relationship type iii) Super class iv) Sub class	[8M]
	b)	Illustrate the usage of SQL GROUP BY, ORDER BY and HAVING clauses.	[8M]
5	a)	How to find closure of an attribute based on a given set of FDs? Write the steps of the algorithm and explain.	[6M]
	b)	What is the importance of dependency preservation during decomposition? How to achieve it?	[4M]
	c)	Explain insertion, deletion, and modification anomalies.	[6M]
6	a)	Discuss in detail about timestamp based concurrency control techniques.	[10M]
	b)	Show how 2PL protocol ensures serializability.	[6M]
7	a)	Distinguish between static and dynamic hashing.	[8M]
	b)	Illustrate how balanced trees are advantageous over search trees.	[8M]
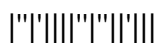
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III B.Tech I Semester Supplementary Examinations, October/ November - 2016
POWER ELECTRONICS
(Electrical and Electronics Engineering)
Time: 3 hours   Max. Marks: 75
Answer any FIVE Questions
All Questions carry equal marks
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1 a) What is IGBT? What are advantages of IGBT over power BJT and power MOSFET?   [8M]
   b) Explain the dynamic characteristics of SCR.   [7M]

2 a) What is the need for series and parallel connection of SCRs? Explain with an   [8M]
       example.
   b) Discuss about SCR specifications and ratings.   [7M]

3   Explain with the help of neat power-diagram and associated waveforms, the   [15M]
       operation of a single phase half controlled converter with
       a) Resistive load and **b**) Inductive load.

4   A single –phase fully controlled bridge converter with RL load is supplied from 220   [15M]
       V, 50 Hz ac supply. If the firing angle is 45°, determine (**a**) average output voltage,
       (**b**) displacement factor, (**c**) input power factor and (**d**) harmonic factor.

5   Draw the circuit diagram of three – phase half controlled rectifier with RL load and   [15M]
       explain its operation with voltage and current waveforms.

6 a) Discuss the operating principle of a mid-point type, single phase to single –phase   [8M]
       step – down cycloconverter using wave forms .Mention the conduction of various
       thyristors in the waveforms.

   b) Explain the operation of a single phase AC voltage converter with resistive load.   [7M]

7 a) Define chopper. What are the types of chopper? What are the applications of   [7M]
       chopper?

   b) A simple d.c. chopper is operating a frequency of 2 kHz from a 96 V d.c. source to   [8M]
       supply a load resistance of 8 ohm. The load time constant is 6 ms. If the average load
       voltage is 57.6 V, find the T$_{on}$ period of the chopper and the average load current.

8 a) Explain sinusoidal pulse modulation used for PWM inverters. Write the important   [8M]
       features of the same.
   b) Discuss Uni polar Inverter operation with relevant waveforms.   [7M]

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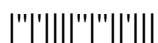
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Set No. 1

III B.Tech I Semester Supplementary Examinations, October - 2016
THERMAL ENGINEERING-II
(ME &AME)

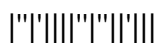Time: 3 hours   Max. Marks: 75
Answer any FIVE Questions
All Questions carry equal marks
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1 a) Explain the method of Reheating with the help of neat sketch.   [7M]
   b) A steam engine receives steam at a pressure of 5.6 bar and 190^0C.The pressure at   [8M]
       release is 2.8 bar and back pressure 1.0 bar. Determine (**a**) Work done in KJ/kg of
       steam (**b**) Efficiency of the cycle.

2   The following particulars refer to a steam plant consisting of boiler, economizer and a   [15M]
       super heater:
       Steam pressure=14 bar; Mass of steam generated=5000 kg/hr; Mass of coal used=675
       kg/hr; Calorific value of coal=29,800KJ/kg of coal; Temperature of feed water entering
       the economizer=30^0C;Temperature of feed water leaving the economizer=130 ^{0}
       ;Dryness fraction of steam leaving the boiler=0.97;Temperature of steam leaving the
       super heater=320^0C
       Determine **i**) Overall efficiency of the plant **ii**) The percentage of the available heat
       utilized in the boiler, economizer and super heater respectively.

3 a) What are the effects of supersaturation on discharge and heat drop?   [5M]
   b) Derive the condition for maximum discharge through the convergent divergent nozzle.   [10M]

4   The steam enters an impulse wheel having a nozzle angle of 20^0 at a velocity of 450   [15M]
       m/s. The exit angle of the moving blade is 20^0 and the relative velocity of the steam
       may be assumed to remain constant over the moving blades. If the blade speed is
       180m/s, determine i) Blade angle at inlet   ii) Work done per kg of steam iii) Power of
       the wheel, when the turbine is supplied with 1.8 kg of steam per second.

5 a) Distinguish between impulse and reaction turbine   [5M]
   b) A reaction turbine running at 360 rpm consumes 5 kg of steam per second. The leakage   [10M]
       is 10%.The discharge blade tip angle for both moving and fixed blades is 20^0.The axial
       velocity of flow is 0.75 times blade velocity. The power developed by a certain pair is
       4.8 kW where the pressure is 2 bar and dryness fraction is 0.95. Find the drum diameter
       and blade height.

6 a) Prove with the help of an example that the vacuum efficiency decreases with the   [7M]
       increase in barometric pressure.
   b) Explain the principles of operation of different types of jet condensers. Describe with a   [8M]
       sketch of evaporative condensor with the neat sketch.

1 of 2

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7 a) List out the uses of gas turbines.   [5M]

   b) In a gas turbine plant, air is compressed from 1 bar and 15^0 C through a pressure ratio   [10M]
       of 4:1.It is then heated to 650^0C in a combustion chamber and expanded back to a
       pressure of 1 bar in a turbine. Calculate the cycle efficiency and work ratio, if a perfect
       heat exchanger is used. Assume isentropic efficiency of the turbine and compressor are
       85% and 80% respectively.

8 a) Explain the working of the ramjet with a neat sketch.   [5M]

   b) A turbo jet engine flying at a speed of 960 km/hr consumes air at the rate of 54.5 kg/s.   [10M]
       Calculate:(**i**) Exit velocity of jet when the enthalpy change for the nozzle is 200KJ/kg
       and velocity coefficient is 0.97, (**ii**)fuel flow rate in kg/s when the air-fuel ratio is 75:1
       (**iii**) Thrust specific fuel consumption (**iv**) Thermal efficiency of the plant when the
       combustion efficiency is 93% and calorific value of the fuel is 45000KJ/kg, (**v**)
       Propulsive power (**vi**) Propulsive efficiency (**vii**) Overall efficiency.
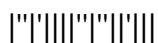
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Code No: **R31044**

R10

III B.Tech I Semester Supplementary Examinations, October/November - 2016
ELECTRONIC MEASUREMENTS AND INSTRUMENTATIONS
(Com. to ECE, EIE)

Time: 3 hours   **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1 a) Define the terms accuracy, precision, resolution and sensitivity.   [8M]
   b) Three resistors have the following ratings: $R_1=47\Omega\pm4\%$, $R_2=65\Omega\pm4\%$ and   [4M]
       $R_3=55\Omega\pm4\%$. Determine the magnitude and limiting error in ohms and percentage of
       the resistance if these resistors connected in series.
   c) Determine the resistor value required to use a $0-1mA$ meter with an internal   [3M]
       resistance of 125Ω for a $0-1\Omega$ for a $0-1V$ meter.

2 a) Explain how square wave is generating by using Astable multivibrator and draw its   [7M]
       functional diagram.
   b) What are the basic elements of function generator? Explain their function.   [8M]

3 a) Explain how wave analyzer is used to measure the relative amplitudes of single   [8M]
       frequency components in a complex waveform.
   b) What are the different types of frequency instabilities in spectrum analyzer? Explain   [7M]
       them.

4 a) Explain the Electrostatic focusing system of a CRT and draw its internal structure.   [7M]
   b) Why delay line used in the vertical section of the oscilloscope?   [4M]
   c) Why is an attenuator probe used?   [4M]

5 a) Draw the simplified block diagram of the sampling circuitry and explain it.   [8M]
   b) Explain the working of frequency counter with suitable block diagram.   [7M]

6 a) Explain how Wien bridge is used to measure the frequency?   [8M]
   b) What are the different precautions are required while measuring with bridges? What   [7M]
       type of errors occurs in this measurement?

7 a) What is LVDT? What are the parameters that can be measured by this? Explain with   [7M]
       a diagram and output characteristics the principle of it operation.
   b) A resistance wire strain gauge having nominal resistance of 250Ω is subjected to   [4M]
       strain of 500 microstrain. Find the change in the value of resistance, neglecting the
       piezoelectric effect.
   c) Explain the principle of working of piezoelectric transducer.   [4M]

8 a) What are the different elements in analog data acquisition system?   [7M]
   b) Explain how to measure pressure with suitable example.   [8M]

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