Code No. 11430/CBCS

FACULTY OF ENGINEERING

B.E. (Civil) IV - Semester (CBCS) (Suppl.) Examination, December 2018/January 2019

Subject : Surveying – II

Time : 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (20 Marks)

1 What are the permanent adjustments in a theodolite? (2)
2 Briefly list out the applications of a total station. (2)
3 What instrumental errors are eliminated by face left and face right observations? (2)
4 What are the advantages of reciprocal observations over a single observation in trigonometrical levelling? (2)
5 What is apex distance? Express it mathematically. (2)
6 What is the difference between a compound curve and a composite curve? (2)
7 What is the type of vertical preferred? Why? (2)
8 How do you calculate the length of a vertical curve? (2)
9 Briefly describe the principles of remote sensing (2)
10 What is GPS? Explain briefly. (2)

PART- B (50 Marks)

11 (a) What is spire test. Explain how is it conducted? (5)
(b) What are the advantages and disadvantages of a total station? (5)

12 (a) What is error of closure? How is it balanced by using Bowditch's Method? (4)
(b) For the following traverse, compute the length CD, so that A, D and E may be in one straight line. (6)

Line	Length (m)	Bearing
AB	110	$83^0\,12^1$
BC	165	$30^0\,42^1$
CD	?	$346^0\,6^1$
DE	212	$16^0\,18^1$

13 (a) How do you set a simple curve by using successive bisection of arcs? (4)
(b) Two straights intersect at an angle of 130°. The maximum allowable speed on the curve is 60 kmph. If the allowable rate of change of radial acceleration is 30 cm/s^3 and the centrifugal ratio is 0.25; calculate the radius of circular curve and length of the transition curve. (6)

14 Calculate the RL's of various station pegs on a vertical curve connecting two uniform grades of 0.5% and -0.7%. The chainage and RL of the point of intersection are 500 m and 330.750 m respectively. Take the rate of change of grades as 0.1% per 30m. (10)

15 What is aerial photogrammetry? What are its principles? What are the different types of photographs? (10)

16 (a) What do you understand by omitted measurements? Briefly describe the various cases. (5)
(b) What is tangential method of tacheometry? What are its advantages and disadvantages over the stadia method. (5)

17. Write short notes on: (10)
(a) Types & Applications of Total Station
(b) Gale's traverse table
(c) Elements of Reverse curve

*****

OU-1607 OU - 1607

CODE NO : 11437/CBCS

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS)(EEE) (Suppl.) Examination, Dec. 2018 / Jan. 2019

PAPER: Power system - I

Time :3 Hours Max Marks : 70

Note: Answer all questions from Part-A & Any five questions from Part-B.

Part-A (20 Marks)

1 Define Diversity Factor & Load factor? 2 M

2 What is the importance of power factor improvement? 2M

3 What are the advantages & disadvantages of pulverizing the fuel used in thermal power stations? 2 M

4 Explain flow duration curve in hydro electric power plants? 2 M

5 Differentiate PWR & BWR? 2M

6 Explain the basic principles of wind power generation? 2M

7 What are the various types of Insulators used in over head lines? 2 M

8 Explain the necessary requirements of underground cables? 2 M

9 Why it is preferable to use more than one conductor per phase rather than a solid or round conductor? 2 M

10 What is Skin Effect? 2M

Part-B (50 Marks)

11 a) Discuss about economics of power factor improvement & Derive the most economical power Factor? 7M

b) Explain the depreciation by Straight line method 3M

12 a) A 2-wire DC Ring distributor is 300m long and is fed at 240 V at point A. At point B, 150m from A, a load of 120 A is taken and at C, 100m in the opposite direction a load of 80 A is taken. If the resistance per 100m of single conductor is 0.03 ohms, Find:
(i) Current in each section of distributor
(ii) Voltage at points B and C 5M

b) Explain the operation of Economizer, Super heater & Condenser in Thermal Power Plant? 5 M

13 a) Draw the schematic diagram of Nuclear Power station and explain the working of different components of it? 8 M

b) Compare conventional & non conventional energy sources? 2 M

14. a) Derive an expression for Sag of a line supported between two supports of same height? 5M

b) Define string efficiency & Explain the improvement of string efficiency by using a Guard Ring? 5M

...2

OU - 1607 OU - 1607

15 a) A 3-phase ,5KW induction motor has a power factor of 0.75 lagging. A bank of capacitors are connected in delta across the supply terminals and power factor is raised to 0.9 lagging. Determine the KVAR rating of the capacitors connected in each phase. 5M

b) Calculate the inductance of each conductor in a 3-phase, 3-wire system when the conductors are arranged in a horizontal plane with spacing such that D_{31} =4 m ; D_{12} = D_{23} = 2 m. The conductors are transposed and have a diameter of 2.5 cm. 5M

16) Derive an expression for inductance of a three phase overhead transmission line when the conductors are un-symmetrically placed but transposed? 10 M

17) Answer any two of the following : 10 M

a) Prime movers used in Hydro electric power plants
b) Capacitance of three core cables
c) Objectives of Tariff

****

OU - 1607 OU - 1607

Code No: 11440/CBCS

FACULTY OF ENGINEERING

B.E IV-Semester (CBCS)(Inst)(Suppl.) Examination, Dec. 2018 /Jan. 2019

Subject : Transducer Engineering

Time: 3 Hours **Max Marks: 70**

Note: Answer all questions from Part-A & Any Five questions From Part-B.

Part-A (20 Marks)

1. Define sensitivity and stability. [2]
2. Explain the term dynamic error. [2]
3. Enlist the requirements of transducer. [2]
4. Differentiate between active and passive transducer. [2]
5. Explain RVDT. [2]
6. What are the advantages Capacitive displacement Transducer. [2]
7. A platinum thermometer has a resistance of 100 Ω at 25 °C. Find its resistance at 65 °C. [2]
8. Explain law of intermediate temperature. [2]
9. How can pressure be measured using a variable reluctance sensor? [2]
10. Compare flat type and corrugated type diaphragm. [2]

PART-B (50 Marks)

11. a) What is a first order system? Derive the response of the first order system for step and ramp inputs. [10]

12. a) What is Gauge factor? Derive the expression for gauge factor in a strain gauge. [6]
    b) Discuss the special features and applications of semiconductor strain gauges. [4]

13. Explain Mc Leod Gauge in detail with neat diagram. What are its advantages and disadvantages? [10]

14. a) Explain in detail the construction and working Principle of LVDT. [6]
    b) Explain the technique of moisture measurement using capacitive transducer. [4]

15. a) Explain liquid in glass thermometer. [5]
    b) With schematic diagram explain vapour pressure thermometer. [5]

16. Write short notes on:
    a) Thermocouple laws [5]
    b) Derive output voltage equation of ballast circuit used to measure strain. [5]

17. Write a short notes on
    a) IC temperature detectors [5]
    b) Bourdon Tube. [5]

****

OU - 1607 OU - 1607

Code No.11446

FACULTY OF ENGINEERING

B.E. (ECE) IV - Semester (CBCS) (Suppl.) Examination,
December 2018/ January 2019

Subject : Probability Theory & Stochastic Process

Time : 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A & any five questions from Part-B.

PART – A (20 Marks)

1 It is known that screws produced by a certain company will be defective with probability of 0.01 independent of each other. The company sells the screws in packages of 10 and offers a replacement guarantee that atmost 1 of the 10 screws is defective. What proportion of packages sold must the company replace? (2)
2 Explain Mutually Exclusive Events and Independent Events with an example? (2)
3 State and prove the properties of Joint Distribution Function. (2)
4 State Chebychev's Inequality. (2)
5 State Central Limit Theorem. (2)
6 Prove that if two random variables are independent, then the Covariance is Zero. (2)
7 Define the terms Mean-Ergodic Process and Correlation-Ergodic Process. (2)
8 A random process is defined by X(t)= A , where A is continuous random variable uniformly distributed on [0,1]. Show that X(t) is stationary process. (2)
9 State and prove the properties of Cross-Power density Spectrum. (2)
10 Define white noise and Colored noise. (2)

PART – B (50 Marks)

11 (a) Manufacturer A produces smartphones at two different locations in the world. Fifteen percent of the smartphones produced at location X are delivered defective to a retail outlet, while five percent of the smart phones produced at location Y are delivered defective to the same retail store. If the manufacturing plant X produces 10,00,000 smartphones per year and the plant Y produces 15,00,000 smartphones per year , find the probability of purchasing a defective smartphone. (5)

(b) In a game of poker, you are dealt five cards from a standard 52 card deck. What is the probability of flush in any suit? (A flush is when you are dealt all five cards of same suit.) (5)

12 (a) Find the characteristic function of Gaussian Random variable with mean and variance (6)

(b) A random variable X has a probability density (4)

$$f_x(x) = \begin{cases} (\pi/16)\cos(\pi x/8) & -4 \le x \le 4 \\ 0 & elsewhere \end{cases}$$

Find (a) mean (b) variance.

13 Given the joint distribution function. (10)

$F_{X,Y}(x, y) = u(x)u(y)[1 - e^{-ax} - e^{-ay} + e^{-a(x+y)}]$

(a) Find the conditional density function $F_X(x \mid y)$ and $F_y(y/x)$.

(b) Are the random variables X and Y are statistically independent.

OU - 1607 OU - 1607

14. For two random variables X and Y (10)

$f_{X,Y}(x,y) = 0.15¢(x+1)¢(y) + 0.1¢(x)¢(y) + 0.1¢(x)¢(y-2) +$
$0.4¢(x-1)¢(y+2) + 0.2¢(x-1)¢(y-1) + 0.05¢(x-1)¢(y-3)$

Find (a) correlation (b) the covariance (c) correlation coefficient
(d) Are X and Y uncorrelated or orthogonal?

15 Statistically independent, zero-mean random process X(t) and Y(t) have auto-correlation functions $R_{XX}(²) = e^{-|²|}$ and $R_{YY}(²) = \cos(2®²)$ (10)

(a) Find autocorrelation of sum W_1 (t) =X (t) +Y (t)
(b) Find the autocorrelation of the difference W_2 (t) = X (t) - Y (t)
(c) Find the cross-correlation function of W_1 (t) and W_2 (t).

16 Show that power density spectrum and the time average of the autocorrelation function forms a Fourier Transform pair. (10)

17 (a) The spectral density of WSS random process X(t) is given by

$S_{XX}(\mu) = \frac{\mu^2}{\mu^4 + 13\mu^2 + 36}$. Find autocorrelation and average power of the process. (6)

(b) A random process X(t) whose mean value is 2 and $R_{XX}(²) = 4e^{-2|²|}$ is applied to a system whose transfer function is $\frac{1}{2 + j\mu}$. Find autocorrelation and PSD of output signal Y(t) being output signal. (4)

*****

OU - 1607 OU - 1607

Code No. 11450

FACULTY OF ENGINEERING

B.E IV-Semester (CBCS) (Mech) (Suppl.) Examination, Dec. 2018 / Jan. 2019

Subject: Applied Thermodynamics

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A and any five questions from Part -B

PART-A (20 Marks)

1. Distinguish between single- stage and multi- stage reciprocating air compressors?
2. Define the clearance ratio for a reciprocating air compressor and its significance?
3. Define equivalent ratio?
4. Write the importance of swirling effect in C.I. engines?
5. Define brake specific fuel consumption, brake thermal efficiency and, indicated thermal efficiency of an I.C. engine.
6. What are the engine parameters effected in knocking of S.I. engine?
7. Classified the boilers?
8. Define the condenser and explain any jet type condenser?
9. Define nozzle efficiency?
10. How does reheating improve the performance of Rankine cycle?

PART-B (5x10=50 Marks)

11. In a single–acting, two-stage reciprocating air compressor handles 4.5kg of air per minute and compress it from 1.013 bar 17^{o}C through a pressure ratio of 9. The index of compression & expansion in both stages is 1.3, if the inter cooling is complete find the minimum indicated power and cylinder swept volume required. Assume the clearance volumes of both the stages are 5% of their respective stroke volumes and compressors runs at 300rpm. Take R=0.287 kj/kg k.

12. Six-cylinder, gasoline engine operates on the 4-stroke cycle. The bore of the each cylinder is 80mm and stroke length is 100mm. the clearance volume per cylinder is 70cc, at a speed of 4000rpm the fuel consumption is 20kg/hr and torque developed is 150N-M; calculate 1) the brake power; 2) the brake mean effective pressure; 3) brake thermal efficiency if the calorific value of the fuel is 43000kJ/Kg and 4) relative efficiency on the brake power basis. Assuming the engine works on the constant volume cycle γ= 1.4 for air.

13. a) Discuss about the stages of combustion in S.I. engine using a sketch of pressure Vs. crank angle diagram.
    b) Discuss the factors effecting the delay period in diesel engine.

14. Sketch and label the following. Also explain their functioning.
    a) Benson boiler.
    b) High- level jet condenser.

..2

CC - 1607 OU - 1607

15. A regenerative system is added to an 8MW steam power plant that operates of a ideal rankine cycle. Steam enters into the inlet of the turbine of 8MPa and 763K and subsequently gets cooled to a saturated liquid at 3kPa in the condenser. A suitable portion of the steam is withdrawn from the turbine at 4MPa, and the remaining steam is expanded to the condenser pressure level. Then, the pressure of this steam is raised to 4MPa to get mixed with extracted steam from the turbine in open feed water heater. Determine a) quality of steam at the exit of turbine, b) net work output per unit mass and c) thermal efficiency.

16. Define critical pressure of nozzle and derive condition for critical pressure.

17. Write short notes on the following.
    a) Mist lubrication system.
    b) Battery ignition system.
    c) Advantages of multi stage reciprocating air compressors.

****

OU - 1607 OU - 1607

Code No. 11453/CBCS

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (Prod) (Suppl.) Examination, Dec. 2018 / Jan. 2019

Subject: Applied Thermodynamics and Heat Transfer

Time: 3 Hours **Max. Marks: 70**

Note: Answer All Questions From Part - A and Any Five Questions From Part-B.
Assume suitable data, if required for solving the Numericals.

PART-A (20 Marks)

1. List out the advantages of multi-staging in reciprocating air compressors and define volumetric efficiency of reciprocating air compressor.
2. Define Free air delivered and write what is intercooler and after cooler.
3. Distinguish between “2-stroke” and “4-stroke” IC engine.
4. What are the differences between a petrol engine and diesel engine?
5. Define “Octane number rating" of an S.I. engine fuel.
6. Write the desirable characteristics of combustion chamber for S.I. engines.
7. Write the Fourier Law and Stefan- Boltzmann law of heat transfer.
8. Define “thermal diffusivity” and give its S.I. unit.
9. What are the advantages and limitation of Dimensional analysis?
10. Write the Wien’s law for spectral emissive power of a black body and mention various terms in it.

PART-B (5x10=50 Marks)

11. Calculate the bore diameter (D) and stroke length (L) of a double- acting, single –stage air compressor of indicated power 37.5kw. The air is drawn in at 1 bar (abs) and 15^{o}C, while the compression occurs in accordance with the law $pv^{1.2}$=constant to 6 bar (abs). The speed of the compressor is 100rpm, while the average piston speed is 150m/min. Neglect the clearance volume.

12. A two-stroke cycle I.C. engine has a mean effective pressure of 6 bar. The speed of the engine is 1000 rpm. If the diameter of the piston and stroke are 110mm and 140mm respectively. Find the indicated power developed.

13. Draw a labeled sketch and explain the working of coil-ignition system in SI engines

14. Explain the process of combustion in C.I. engines and also explain the various stages of combustion.

15. a) What is free convection and write some examples of free convection observed in every day life.
    b) Explain the concept of Black body.

16. a) Describe the working of a Four-Stroke petrol engine.
    b) Explain temperature and velocity profiles in free convection on a vertical wall.

17. Write short notes on :
    a) Temperature variations in parallel flow and counter flow heat exchangers.
    b) Detonation in SI- engines.
    d) Emissivity.

****

OU - 11607 QU - 1607

Code No. 11456/CBCS

FACULTY OF ENGINEERING

B.E. IV-Semester (A.E.)(CBCS) (Suppl.) Examination, December 2018/January 2019

Subject : Metallurgy & Material Testing

Time : 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (20 Marks)

1 List various types of crystal defects.
2 State the features of ductile fracture.
3 What is low cycle fatigue?
4 List the applications of diffusion in industrial applications.
5 What is phase diagram? Mention its applications.
6 How plain carbon steels are classified?
7 Write the differences between annealing and normalizing.
8 What is carburizing? List the different methods of carburizing process.
9 List various types of destructive tests.
10 Describe the principle of radiography test.

PART – B (50 Marks)

11 (a) What is critical shear stress? Derive the critical resolve shear stress relating the tensile stress.
(b) Discuss in detail the variation in properties and structure of material when a cold worked material is heated to successively higher temperature.

12 (a) What is creep? Explain how a creep test is conducted.
(b) Explain various factors that affect the fatigue life of a material.

13 (a) Define following phases related to Fe-Fe_3C phase diagram.
(i) Ferrite (ii) Austenite (iii) Pearlite (iv) Ledeburite (v) Cementite
(b) Explain the invariant reactions that occur on Iron – Iron carbide phases diagram.

14 (a) Explain the need of tempering a hardened steel. Describe the process of tempering.
(b) What is surface hardening? Explain the method of induction hardening process.

15 (a) Briefly explain the applications of polymers in automotive industry.
(b) Explain the principle, advantages and limitations of Rockwell hardness test.

16 (a) Explain various types of point defects.
(b) Explain the method of manufacture, properties and applications of malleable cast iron.

17 Write short notes on the following:
(a) Stress rupture curve
(b) Martempering
(c) Liquid penetrant test

*****

OU-1607 OU - 1607

Code No: 11460/CBCS

FACULTY OF ENGINEERING

B.E. IV Semester (CBCS)(CSE) (Supple) Examination, Dec./Jan. 2018-19

Subject: OOP using Java

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A &Any Five questions from Part B

PART – A (20 Marks)

1. Mention the restrictions of a method declared as static. 2
2. Write a program to find sum of elements of an array using for each loop 2
3. What are the differences between checked and unchecked exception 2
4. What is a stream? What are 2 types of stream that Java defines? List 2 I/O classes in each category. 2
5. List the purpose of String and String Buffer class. 2
6. Brief about BitSet and Date Classes. 2
7. Explain briefly the class hierarchy for Panel and Frame. 2
8. List the different type of controls supported by AWT. 2
9. List the classes contained in java.net package. 2
10. List the methods of Object class. 2

PART – B (5 x 10 = 50 Marks)

.11. (a) Write a program to find sum of numbers passed as command line arguments 5
(b) Write a program to demonstrate multilevel hierarchy, Use super to call Super class constructor. 5

12. (a) Does Java support run-time polymorphism? Illustrate with an example 5
(b) How are threads synchronized? Illustrate with an example. 5

13. (a) Write a program to check whether a string is palindrome or not. 5
(b) Write a program to demonstrate the implementation of Cloneable and defies the method clone Test(), which calls clone() in object. 5

14. (a) Write a program to create a simple list with items. 4
(b) Write a program for keyboard even handling. 6

15. (a) Explain the steps involved in creation and handling of Menus 5
(b) Write a program to demonstrate a simple socket. 5

16. (a) Write a program to copy one file content to another file. 5
(b) Write a program to read from console and write to console. 5

17. (a) Write short note on
a) Multiple Inheritance Issues b) Abstract Class c) Jump statements. 10

****

OU - 1607 OU - 1607

Code No. 11466

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (I.T) (Suppl.) Examination, Dec. 2018/ Jan. 2019

Subject: OOP Using JAVA

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A and Any five questions from Part-B.

PART – A (20 Marks)

1. What is byte code? What is the significance of it?
2. What is the difference between String, String Buffer and String Builder
3. What is the use of super keyword
4. What is the difference between final, finally and finalize
5. What are the differences between checked and unchecked exceptions?
6. What is the normal priority of a thread and how the priority of a thread can be changed?
7. What is the difference between Iterator and List Iterator?
8. What is Serialization? Which type of variable cannot be serialized?
9. List the different AWT controls.
10. Which container use a Flow Layout as their default layout.

PART – B (50 Marks)

11. a) Define package. How do you create and use packages? Illustrate with an example. 8
    b) What are inner classes. 2

12. What is polymorphism? Differentiate between compile time and run time polymorphism with help of complete diagram. 10

13. What is multithreading? What are two different ways to create multithread program with example program? 10

14. Explain the concept of thread synchronization with help of a program? Explain wait method in the context of synchronization. 10

15. Write a program for keyboard event handling. 10

16. Explain the following classes with suitable example. Buffered Reader, File Input Stream, Print Writer. 10

17. Write short notes on following: String Tokenizer, Applet, Checkbox Group. 10

****

OU - 1607 OU - 1607