

**VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)**

B.E. DEGREE EXAMINATION- APRIL /MAY - 2018

AERONAUTICAL ENGINEERING

Fourth Semester

AERODYNAMICS – I

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. State the energy equation for compressible flow.
2. State Bernoulli's equation.
3. Define circulation.
4. What is a free vortex flow?
5. How wing tip vortices are formed?
6. What are the types of airfoil?
7. What is geometric twist?
8. State Biot and Savart law.
9. Define energy thickness.
10. Differentiate Laminar flow and turbulent flow.

PART-B (5 x 16 = 80 Marks)

- 11.a) Briefly discuss about aerodynamic forces.

OR

- b) Explain about Vorticity, Circulation and Wake.

- 12.a) Derive the expression for determination of stagnation point.

OR

- b) Explain vortex flow with all the characteristics and derive stream function.

- 13.a) Derive Cauchy-Riemann relations.

OR

- b) Using conformal transformation transform a circle to an ellipse.

- 14.a) With neat relevant sketches briefly explain Karman-Trefftz profiles.

OR

- b) Briefly discuss the vortex sheets application to aerofoil's.

- 15.a) Explain about Boundary layer and its types.

OR

- b) A source with strength 0.25 m/s and vortex with strength 1 m/s (-ve) are occurred at origin. Determine stream and velocity potentials. Calculate Radial and Tangential velocity components at (1, 0.5).

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E. DEGREE EXAMINATION- APRIL /MAY - 2018

AERONAUTICAL ENGINEERING

Fourth Semester

PROPULSION -I

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is by pass engine?
2. Explain thrust equation in brief.
3. What is stagnation pressure recovery factor?
4. What are the various types of combustors used in aircraft propulsion?
5. State the importance of power input factor.
6. State the purpose of a centrifugal compressor.
7. What do you mean by a radial flow turbine?
8. Define total to total efficiency of a turbine.
9. Differentiate between subsonic and supersonic inlets.
10. What is the operating cycle of a ramjet engine?

PART-B (5 x 16 = 80 Marks)

- 11.a) Describe in detail methods of thrust augmentation.

OR

- b) The diameter of the propeller of an aircraft is 2.5m. It flights at a speed of 500 Km/hr at an altitude of 8000m. For a flight to jet speed ratio of 0.75. Determine (a) the flow rate of air through the propeller (b) Thrust produced (c) Specific thrust (d) Specific impulse (e) Thrust power.

- 12.a) An aircraft engine employs a diverging inlet diffuser with inlet and exit areas of 3000 and 4500 cm² respectively. At design condition, a normal shock occurs at the inlet to the diffuser. The Mach number at the exit of the diffuser is 0.3. What is the design flight mach number of the aircraft? Assume isentropic flow in the divergent region. Use isentropic flow tables wherever required.

OR

- b) Describe in detail modes of operations of a supersonic inlet with neat diagrams.

13.a) Describe impeller, inducer and coriolis acceleration with respect to centrifugal compressor.

OR

b) Air at 1.0 bar and 288 K enters an axial flow compressor with an axial velocity of 150 m/s.

There are no inlet guide vanes. The rotor stage has a tip diameter of 60 cm and a hub diameter of 50 cm and rotates at 100 rps. The air enters the rotor and leaves the stator in the axial direction with no change in velocity or radius. The air is turned through 30.2 degree as it passes through the rotor. Assume a stage pressure ratio of 1.2 and overall pressure ratio of 6. Find (a) the mass flow rate of air, (b) the power required to drive the compressor, (c) the degree of reaction at the mean diameter, (d) the number of compressor stages required if the isentropic efficiency is 0.85.

14.a) Briefly explain stage efficiency in a gas turbine. Also describe the two commonly used efficiencies in a gas turbine with T-S diagram.

OR

b) An impulse turbine ($R_x = 0$) operates with following pressures at various stations:

$P_{01} = 414$ kPa, $P_2 = 207$ kPa, $P_{02} = 400$ kPa, $P_3 = 200$ kPa when operating with $U_{\text{mean}} = 291$ m/s at $T_{01} = 1100$ K and $\alpha_2 = 70^\circ$. Assuming that $C_1 = C_3$ compute the total-to-total efficiency of the stage.

[Use $C_p = 1148$ kJ/kg.K, and $\gamma = 1.333$]

15.a) "The ramjets engines are more suitable for supersonic flight." Substantiate the statement.

Explain why ramjet engines are not that suitable for hypersonic flights.

OR

b) Describe the working of a ramjet engine. Depict various thermodynamic processes occurring on *h-s* diagram.

Sl.No. E8115

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)

B.E. DEGREE EXAMINATION- APRIL /MAY - 2018

AERONAUTICAL ENGINEERING

Fourth Semester

AIRCRAFT STRUCTURES-I

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

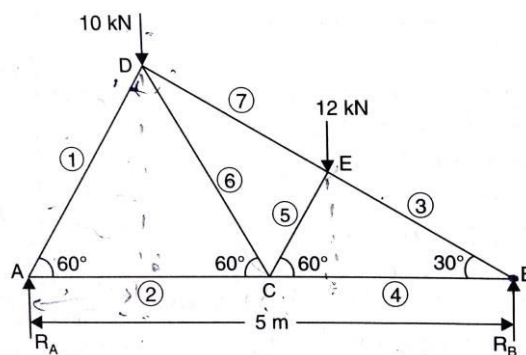
Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is a deficient frame?
2. Differentiate between compressive force and tensile force.
3. Define elastic strain energy?
4. Define indeterminate structure?
5. What are the types of column failure?
6. What are the uses of south well plot?
7. What are the theories used for ductile failures?
8. Define Mohr's circle.
9. What are the main parameters influencing fatigue life?
10. What is the classification of thermal effects on material?

PART-B (5 x 16 = 80 Marks)

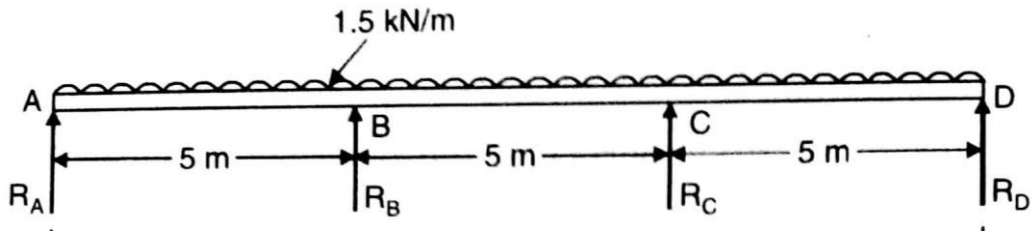
- 11.a) A truss of span 5 m is loaded as shown in figure. Find the reactions and any 4 forces in the members of the truss.



OR

(p.t.o)

- b) A continuous beam ABCD of length 15 m rests on four supports covering 3 equal spans and carries a uniformly distributed load of 1.5 kN / m length. Calculate the moments and reactions at the supports. Draw the S.F. and B.M. diagrams.



- 12.a) A tension bar 5 m long is made up of two parts, 3 metre of its length has a cross-sectional area of 10 cm^2 while the remaining 2 metre has a cross-sectional area of 20 cm^2 . An axial load of 80 kN is gradually applied. Find the total strain energy produced in the bar and compare this value with that obtained in a uniform bar of the same length and having the same volume when under the same load. Take $E = 2 \times 10^5 \text{ N/mm}^2$.

OR

- b) A bar of uniform cross-section 'A' and length 'L' hangs vertically, subjected to its own weight. Prove that the strain energy stored within the bar is given by

$$U = \frac{A \times \rho^2 \times L^2}{6E}$$

6E

Where E = Modulus of Elasticity,

ρ = Weight per unit volume of the bar.

- 13.a) Derive the expiation for column with eccentric load?

OR

- b) Using Euler's formula, calculate the critical stresses for a series of struts having slenderness ratio of 40, 80, 120, 160 and 200 under the following conditions :

i. Both ends hinged and

ii. Both ends fixed.

iii. Take $E = 2.05 \times 10^5 \text{ N/mm}^2$.

- 14.a) (i) Explain the maximum principal stress theory.

- (ii) The principal stresses at a point in an elastic material are 100 N/mm^2 (tensile), 80 N/mm^2 (tensile), and 50 N/mm^2 (compressive). If the stress at the elastic limit in simple tension is 200 N/mm^2 determine whether the failure of the material will occur according to maximum principal stress theory. if not then determine the factor of safety.

OR

- b) (i) Explain the maximum stress strain theory?

(ii) For the data given determine whether failure of material occur or not according to maximum shear theory. $\sigma_1 = 200 \text{ N/mm}^2$ (tensile), $\sigma_2 = 100 \text{ N/mm}^2$ (tensile), $\sigma_3 = 50 \text{ N/mm}^2$ (compressive), $\sigma_t^* = 200 \text{ N/mm}^2$.

- 15.a) Explain in detail about the fatigue process and the stages involved in it.

OR

- b) Explain in detail about the stress relaxation and Design with plastics.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
CALCULUS FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

1

Prove that at the point $x = \frac{\pi}{2}$ of the curve $y = 4 \sin x - \sin 2x$, $\rho = \frac{5\sqrt{5}}{4}$

2

Write the formula for the centre of curvature.

3

Write the sufficient conditions for a maximum (or) minimum.

4

Find $\frac{du}{dt}$ if $u = x^2 + y^2$, $x = at^2$, $y = 2at$.

5

Evaluate $\int x \sin x dx$

6

Evaluate $\int \frac{dx}{(x+2)^2 - 4}$

7

Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} dx dy$

8

Evaluate $\int_0^1 \int_1^2 x(x+y) dy dx$.

9

Find the unit vector normal to the surface $x^2 - y^2 + z = 2$ at the point $(1, -1, 2)$

10

State Green's theorem in plane

PART-B (5 x 16 = 80)

11 a.

Find the equation to the circle of curvature of the curve $xy = c^2$ at (c, c) **OR**

(P.T.O)

- b. Find the radius of curvature at the point θ on $x = 3a \cos \theta - a \cos 3\theta$ and $y = 3a \sin \theta - a \sin 3\theta$

- 12 a. (i) If $u = \sin^{-1} \frac{x}{y} + \tan^{-1} \frac{x}{y}$, then find the value of $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$
 (ii) Find $\frac{du}{dt}$ as a total derivative and verify the result by the direct substitution of $u = x^2 + y^2 + z^2$ when $x = e^{2t}$, $y = e^{2t} \cos 3t$, and $z = e^{2t} \sin 3t$

OR

- b. Find the maximum or minimum value of $f(x, y) = 2 + 2x + 2y - x^2 - y^2$

- 13 a. (i) Evaluate $\int \sqrt{x^2 - 2x - 3} dx$
 (ii) Show that $\int_2^3 \sqrt{(x-2)(3-x)} dx = \frac{\pi}{8}$

OR

- b. (i) Evaluate $\int x \tan^{-1} x dx$
 (ii) Evaluate $\int \frac{e^x(1 + \sin x)}{1 + \cos x} dx$

- 14 a. Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} \int_0^{\sqrt{a^2-x^2-y^2}} \frac{dz dy dx}{\sqrt{a^2-x^2-y^2-z^2}}$

OR

- b. Evaluate $\iint_R r^2 \sin \theta dr d\theta$, Where R is the region above the initial line of the curve $r = 2a \cos \theta$.

- 15 a. Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\vec{i} - 2xy\vec{j}$ taken around the rectangle bounded by the lines $x = \pm a$, $y = 0$, $y = b$

OR

- b. Evaluate $\iint_S \vec{F} \cdot \hat{n} ds$ where $\vec{F} = z\vec{i} + x\vec{j} - y^2z\vec{k}$ and S is the part of the surface of the cylinder $x^2 + y^2 = 1$ included in the first octant between the planes $z = 0$ and $z = 2$

Sl.No. 1981

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
PHYSICS FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Give the examples for elastic bodies.
- 2 Define: bulk modulus of elasticity
- 3 Give the no. of atoms per unit cell and coordination number for FCC
- 4 What are Miller indices?
- 5 Define: Spontaneous emission
- 6 Write any two applications of CO₂ laser.
- 7 What is meant by critical angle?
- 8 What is multimode fiber?
- 9 What is destructive testing?
- 10 Give the demerits of Liquid Penetrant method.

PART-B (5 x 16 = 80)

- 11 a. Describe an experiment to determine Young's modulus of a beam by uniform bending.

OR

- b. Explain about I-shaped girders with neat diagram.

- 12 a. Determine the number of atoms per unit cell, coordination number, atomic radius and packing factor for BCC structure.

OR

- b. What are Miller indices? Write down the procedure finding the Miller indices with examples.

- 13 a. Explain the applications of lasers in scientific, engineering and industrial fields.

OR

- b. Describe the applications of laser in communication, military and chemical fields.

- 14 a. Describe the characteristics, advantages, disadvantages and applications step-index multimode fibre with necessary diagrams.

OR

- b. Write a note on the following
 i)critical angle, ii) total internal reflection, iii) acceptance angle, iv) numerical aperture.

- 15 a. write down the principle, advantages, disadvantages and applications of ultrasonic flaw detector

OR

- b. Describe the X-ray fluoroscopy technique of nondestructive testing.

**VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E DEGREE EXAMINATIONS – NOV/DEC -2018

COMMON TO ALL BRANCHES

First Semester

ENGLISH FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time: Three hours

Maximum:100Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. **Identify the parts of speech for the underlined words.**
 - i) We must help ourselves
 - ii) Oh! we are late for the movie

2. **Correct the following sentences by identifying the errors.**
 - i) Do the roses in your garden smell more sweetly than the roses in ours?
 - ii) If you lend him a book, he will lend it to some one else and never you will get it back.

3. **Define the following definitions.**
 - i) Acid ii) Calculator.

4. **Fill in the blanks with suitable articles.**
 - i) I live in ----- apartment
 - ii) I saw ---- movie last night.

5. **Identify the silent letters for the given words.**
 - i) Psychology ii) Doubt

6. **Choose the correct homonyms for the following.**
 - i) The burning candle created a pleasant ____ in the room. Sent, cent, scent.
 - ii) Would you like a piece of fruit? Perhaps a ____? Pear, pair, pare

7. **Choose the correct homophones for the following.**
 - i) She held the ____ in her hand. Reigns, rains, reins
 - ii) He was a medieval _____. Night, knight

8. **Fill in the blanks with appropriate tense form of the verbs.**

SIMPLE PRESENT TENSE

 - i) Every twelve months, the Earth _____ (circle) the Sun.
 - ii) This delicious chocolate_____ (be) made by a small chocolaty in Zurich, Switzerland.

9. Change the following sentences into impersonal passive voice.

- i) The N. S. S. students will clean our campus.
- ii) We can alter the characteristics of steel in various ways.

10. Complete the following sentence:

- i) If there had been no rains last month, _____.
- ii) If he studied hard, _____

PART – B (5 x 16 = 80 marks)

11. a) What are the characteristics of a good listener?

OR

b) State the importance of pronunciation with its guidelines

12. a) What are the points to remember while making a call and receiving a call?

OR

b) As a manager in a company you are asked to write a report of three of your subordinates for promotion. Prepare a report along with your recommendations.

13. a) Describe a memorable incident in your life.

OR

b) Write a note on skimming

14. a) What are the differences between Spoken and Written English?

OR

b) Write the symbols of Vowels. Explain with examples.

15. a) **Read the passage and draw a flow chart.**

The earth contains a large number of metals which are useful to man. One of the most important of these is iron. The iron ore which we find in the earth is not pure. It contains some impurities which we must remove in the earth is not pure. It contains some impurities which we must remove by smelting. The process of smelting consists of heating the ore in a blast furnace with coke limestone and reducing it to metal. Blasts of hot air enter the furnace from the bottom and provide the oxygen which is necessary for the reduction of the ore. The ore becomes molten, and its oxides combine with the limestone to form a liquid slag. This floats on top of the molten iron, and passes out of the furnace through a tap. The metal which remains is pig iron.

We can melt this down again in another furnace-a cupola-with more coke and limestone, and tap it out into a ladle or directly into moulds

OR

b) Write a letter to your friend Ramesh, expressing your sense of relief at his recovery from a serious and long illness

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
FIRST SEMESTER
ESSENTIALS OF COMPUTER SCIENCE AND ENGINEERING
(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 What is mean by hardware?
- 2 Define Booting.
- 3 Write notes on Bullets and numbering in MS Word.
- 4 Mention the uses of MS Excel.
- 5 List out the way how algorithms may be represented.
- 6 Write an algorithm to find the area of a circle.
- 7 In what way to analyze an algorithm.
- 8 Give an example for top-down analysis.
- 9 List out any four formatting tags in HTML.
- 10 How you define href, target and name Attributes?

PART-B (5 x 16 = 80)

- 11 a. Explain the block diagram of a Computer with neat sketch.

OR

b. Describe the services provided by Internet.
- 12 a. Briefly explain table menu in MS Word.

OR

b. What is a chart and explain different steps for inserting a chart in Excel.
- 13 a. What is flowchart? Explain the symbols used in drawing the flowchart. Also write the rules and advantages of using flowcharts.

OR

b. Write an algorithm and flowchart for generating Fibonacci series.
- 14 a. Discuss the features of an algorithm.

OR

b. Explain the classification of Algorithms.
- 15 a. To create a web page to showing an ordered & unordered list of name of your five friends.

OR

b. Explain in detail about HTML image tags.

VINAYAKA MISSIONS RESEARCH FOUNDATION

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B.E. DEGREE EXAMINATION- NOV /DEC – 2018

COMMONTO AERO, AUTO, CIVIL, ECE, EEE,

EIE, CSE, IT, BME, MECH& & MECT

Second Semester

BUSINESS ENGLISH

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Correct the following sentences using subject and verb agreement.

- a). He can able to operate the computer.
- b) One of my books are missing.

2. Fill in the blank with suitable prepositions.

- a) They ceased work _____ sunset.
- b) He wrote the answer _____ ink.

3. Combine the sentences showing cause and effect relations.

- a) The machine was tested. It was installed.
- b) He was sick. He went to consult a doctor.

4. Write the meaning for the following phrasal verbs and make sentences of your own.

- a). Break up
- b). Agree with

5. Make your own sentences using the following idiomatic phrases

- a) Catch one's eye
- b) Jack of all trades

6. Write British English words for the following American English words.

- a) Fulfill
- b) Favor

7. Write American English words for the following British English Words.

- a) Litre
- b) Mould

8. Make your own sentences for the following compound words.

- a) Boat house
- b) . Animal behavior.

9. Read the answers and frame the questions.

- a) My father is sixty years old.
- b) I come from Bangkok

10. Find out the stress for the following words.

- a). Before
- b). Television

PART-B (5 x 16 = 80 Marks)

11.a) Write some interpersonal etiquette for negotiation skill.

OR

b) What are the important points to be followed by the e-mail users?

12.a) Write a note on Stress.

OR

Rewrite the following jumbled sentences in the correct order.

- b) i. If that strikes oil, then production wells can be drilled.
 ii. They carry out surveys from the ground and from the air using a variety of instruments.
 And they bore into the rocks to take samples.
 iii. When Petroleum engineers search for oil, they look for certain types of rock layers, or strata, which they know from past experience, can trap oil.
 iv. If it indicates that oil may be present, a test well is drilled.
 v. Oil is found underground trapped in the layers of rock.
 vi. When all the information is collected and analyzed, of the underground strata is obtained.
 vii. They also set off explosions in the ground and record the waves reflected from the underground rock layers.
 viii. This is called seismic surveying.

13.a) Recommendations that should be followed for safety in a factory.

OR

b) Write a set of eight recommendations following which you could avoid the attack of swine flu.

OR

14.a) Write instructions that should be followed in computer Laboratory.

OR

b) Write a letter to the Manager of Sharptronics, Chennai. Calling for quotation for the following items. Assume that you are the purchase officer.

Items	Nos
Blue Star AC	3
Usha fans	7
L G Television 32"	1
L G Refrigerator	1

15.a) Prepare a checklist to find a suitable accommodation for your family.

OR

b) Explain the following Proverbs 'No pain, no gain' and Cleanliness is next to Godliness.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
SECOND SEMESTER
CHEMISTRY FOR ENGINEERS

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define oxidation and reduction.
- 2 State the reaction when a lead storage battery is recharged?
- 3 Name any two Coagulants.
- 4 What is cathodic protection?
- 5 Why are plastics indispensable in everyday life?
- 6 What is degree of polymerization?
- 7 Define component with example.
- 8 Calculate the degree of freedom for $2 \text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2 \text{H}_2\text{O}(\text{v})$
- 9 Give the frequency region of Infrared spectrum?
- 10 State Retention time.

PART-B (5 x 16 = 80)

- 11 a. Explain the determination of EMF by Poggendorff's method.

OR

- b. Discuss the electrochemical series and its applications.

- 12 a. (i)How is internal treatment of boiler water carried out?
(ii) Describe the principle and method involved in the determination of different types and amount of alkalinity of water.

OR

- b. (i) Differentiate between chemical corrosion and electrochemical corrosion.
(ii) Illustrate the reactions involved in differential aeration corrosion with reference to the iron material.

- 13 a. (a). What are ceramics and how they are classified? Write the uses of ceramics.
(b). Write a note on Special cements.

OR

- b. Write the preparation, properties and uses of the following
(i) PVC (ii) Teflon (iii) Bakelite

(P.T.O)

14 a. With suitable examples explain the terms phase, component and degree of freedom.

OR

b. Write a detail note on harmful effects of radioactive isotopes.

15 a. Describe Gas chromatography with neat diagram.

OR

b. How will you estimate metals by flame photometer?

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
COMMON TO ALL BRANCHES
SECOND SEMESTER
C PROGRAMMING

(Candidates admitted under 2015 & 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What are the memory requirements of primary data type?
- 2 Mention the various types of operator
- 3 Write the syntax of switch statement.
- 4 Write the Syntax of for statement?
- 5 Find the length of following strings using strlen() function,
char s1[]="program";
char s2[]="importance";
- 6 How to declare a union variable?
- 7 Define library function
- 8 What are the advantages of using a pointer?
- 9 Write the rules for preprocessor directives.
- 10 What is the use of fseek() function?

PART-B (5 x 16 = 80)

- 11 a. Explain the Arithmetic and relational operators in C with suitable program.

OR

- b. Write a C program
- i) To find sum of 5 numbers.
 - ii) To find simple interest.

- 12 a. Explain the types of looping statements?

OR

- b. Write a C program:
- a. i. To find the factorial of a given number using while statement
 - b. ii. To find the factorial of a given number using for statement

- 13 a. Write a C program to explain the concept of structure.

OR

- b. Write a C program to explain the concept of structure within structure.

- 14 a. Discuss the pointer expressions used in the C program.

OR

- b. Write a C program to implement function returning pointers.
- 15 a. Write a C program to altering the allocated memory.

OR

- b. Write about the following function,
 - i. fputs() ii. fgets() iii. fread() iv. fwrite()

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AERONAUTICAL ENGINEERING
FIFTH SEMESTER
MANUFACTURING TECHNOLOGY
(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 Define shrinkage allowance
- 2 What are essential qualities of pattern materials?
- 3 Write short notes on consumable electrode?
- 4 What are the disadvantages of brazing?
- 5 How do you specify the lathe machine?
- 6 What is meant by unconventional machining process?
- 7 Define Plasticity.
- 8 What is the difference between a thermoplastic and a thermosetting plastic?
- 9 Classify forging process.
- 10 Define metal spinning.

PART-B (5 x 16 = 80)

- 11 a. Explain briefly about Shell moulding process with neat sketches.

OR

b. Explain briefly about Investment moulding process with a neat sketch.
- 12 a. Explain the working principle of TIG welding.

OR

b. Explain with a neat sketch submerged arc welding process.
- 13 a. Explain the principle parts of horizontal milling machine with schematic diagram.

OR

b. Explain in detail about the basics of CNC machines.
- 14 a. sketches.

OR

b. Explain the working principle and applications of film blowing process with neat sketches.
- 15 a. Explain the various types of rolling process with neat sketches.

OR

b. Discuss about five groups of products that are commonly produced by powder metallurgy.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AERONAUTICAL ENGINEERING
FIFTH SEMESTER
AERODYNAMICS – II

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Briefly write about one dimensional flow.
- 2 Define Mach cone
- 3 $P_1 = 15 \text{ atm}$, $T_1 = 2500 \text{ K}$, $T_2 = 1350 \text{ K}$, $C_p = 4157 \text{ J/KgK}$, molecular weight (m) = 12. Calculate P_2 in isentropic process.
- 4 Write about nozzle
- 5 Define Mach angle.
- 6 What is compressible flow?
- 7 Write about Upper critical Mach number.
- 8 Differentiate swept back wing & delta wing.
- 9 Write about Supersonic flow visualization.
- 10 What are the types of wind tunnel based on operation?

PART-B (5 x 16 = 80)

- 11 a. Derive Bernoulli's equation with neat sketch.

OR

 b. In a flow of $M_1 = 2.4$, $P_1 = 2 \text{ bar}$, $T_1 = 270 \text{ K}$, $\gamma = 1.3$, $R = 460 \text{ J/KgK}$. Calculate P_2 , T_2 , V_2 , M_2
- 12 a. Write a detail about left running and right running waves.

OR

 b. Explain about Fanno flow with neat sketch
- 13 a. Explain about Linearized supersonic flow.

OR

 b. Air at 400 K and sonic velocity is flowing. Determine velocity flow, velocity of sound, V_{\max} , V_0 , h_0 , C_r .
- 14 a. Explain supersonic airfoil section shapes with neat sketch

OR

 b. Write a detail about various types of drags
- 15 a. Explain closed circuit subsonic wind tunnel with neat sketch.

OR

 b. Write a detail about shock tube and Gun tunnels.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AERONAUTICAL ENGINEERING
FIFTH SEMESTER
AIRCRAFT STRUCTURES-II

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

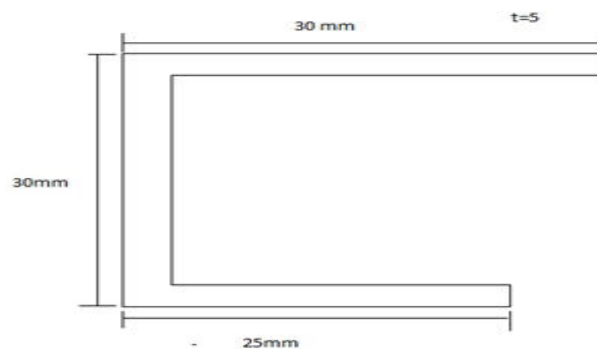
Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What do you understand by unsymmetrical bending?
- 2 Draw bending stress variation across the depth for I-section.
- 3 Draw the shear stress distribution diagram for 'T' section.
- 4 Sketch the shear flow distribution when a thin walled L-section is subjected to a vertical load.
- 5 What is torsional rigidity?
- 6 What is the strain energy density formula for bar and shaft?
- 7 Draw the Stiffened panel terminology.
- 8 What is pure tension field beam?
- 9 What is bulk head?
- 10 What is Modular ratio?

PART-B (5 x 16 = 80)

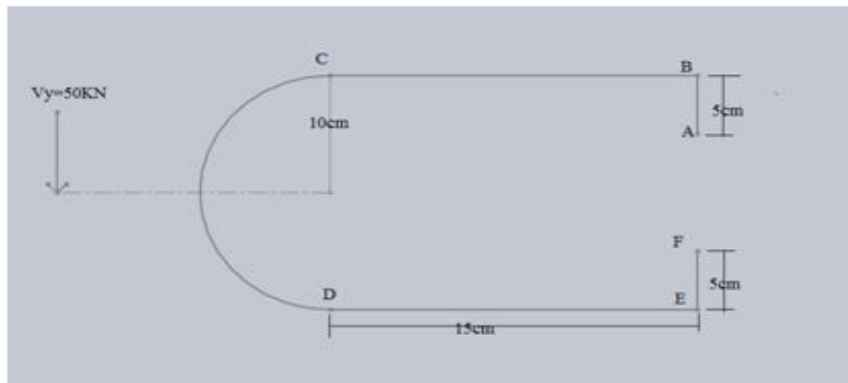
- 11 a. Find the bending moment of the C-section having as shown in fig. Given $M_x=220\text{Nmm}$ by using K-method?



OR

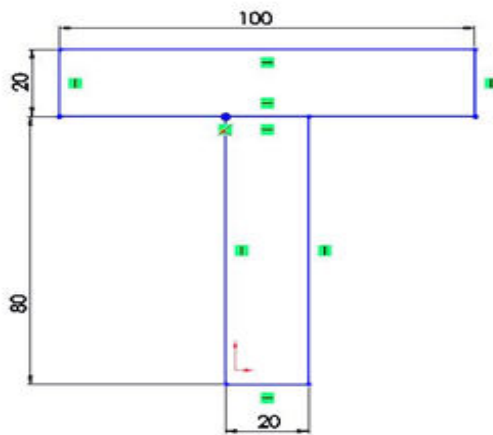
- b. Find the bending moment by using principle axis method for the C-section of web 30cm and flange of 30cm of with an load of $M_x=220\text{Ncm}$ is acting. Given $\bar{X}=9.64\text{cm}$ and $\bar{Y}=15\text{cm}$ $I_{xx}=42.9 \times 10^5 \text{cm}^4$ and $I_{yy}=17.8 \times 10^5 \text{cm}^4$.

- 12 a. Find the shear flow distribution in web of the beam as shown in figure. Each area of boom strength has an area of 4cm^2 & the section is subjected to a vertical load of 50KN .

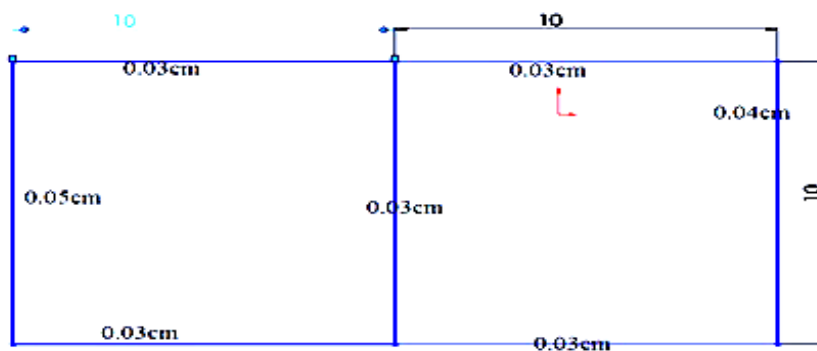


OR

- b. Find the shear flow of the given symmetrical section. Where $V_y = 40\text{N}$.

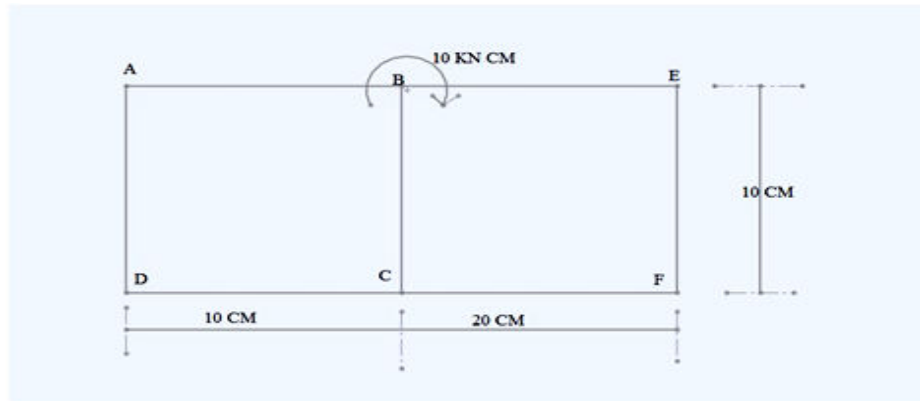


- 13 a. Find the shear flow of the section shown in figure subjected to a torque of 100KN .



OR

- b. Find the shear and also the twist per unit length for the section given below. Take $G=2.5 \times 10^5$ N/cm² and $T=0.1$ cm?



- 14 a. Explain in detail about the buckling of plates?

OR

- b. Give the various Methods for evaluation of elastic critical load.

- 15 a. Explain in detail about the load factor of an invert flight with a graph?

OR

- b. What is structural idealization? Sketch the structural idealization for wing and fuselage?

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AERONAUTICAL ENGINEERING
FIFTH SEMESTER
AIRCRAFT PERFORMANCE

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Give the Froude momentum equation and explain the terms?
- 2 What is mean by propeller governor?
- 3 Name some four types of drag on the aircraft?
- 4 Explain profile drag?
- 5 Give the equation for D_{\min} condition.
- 6 Draw the power required vs velocity curve.
- 7 What is mean by climb?
- 8 Draw the graph between power vs velocity?
- 9 What is mean by stalling speed?
- 10 What is mean by maximum turn rate.

PART-B (5 x 16 = 80)

- 11 a. Explain in detail about the Performance of fixedpitch propellers?
OR
 b. Derive the Propeller theory and wright the assumptions made to derive?
- 12 a. Explain In detail about the stalling with neat sketch?
OR
 b. Explain the terms: i)Total drag on airplane
 ii) Types of airfoil and its nomenclature iii)Angle of incidents
- 13 a. Derive the following conditions: i) $(C_L/C_D)_{\max}$ ii) $(C_L^{3/2}/C_D)_{\max}$
OR
 b. Derive the derivation for Range and Endurance of Jet airplanes.
- 14 a. Explain in detail about the climbing hodograph and climbing hodograph.
OR

(P.T.O)

b. An airplane wing has 2, 50,000N of wing load, has a wing area of 80m² its drag polar is given by $C_D=0.016+0.04C_L^2$. Calculate the minimum time and minimum power required of straight and level flight and the corresponding true airspeed at sea level and at 1000m altitude. Given $\sqrt{\sigma}=0.58$ (density ratio)

15 a. Derive the derivation for the turning flight and give the derivation for the maximum turn radius?

OR

b. Explain the term i) Level turn ii) Minimum turn radius iii) Bank angle iv) (iv) Load factor

Sl.No.1258

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AERONAUTICAL ENGINEERING
FIFTH SEMESTER
ELECTIVE - TOTAL QUALITY MANAGEMENT
(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions
Part-A (10 x 2 =20 Marks)

- 1 Name any four prominent TQM pioneers.
- 2 Define leadership in quality aspects.
- 3 Mention any four components of service quality.
- 4 Expand and explain the term “PDSA”.
- 5 Differentiate between process capability and process capability index.
- 6 Mention the importance of six sigma.
- 7 Write short notes on product benchmarking.
- 8 Explain with an example on target.
- 9 Write a key note on quality system.
- 10 Mention the documents required for the implementation of quality system.

PART-B (5 x 16 = 80)

- 11 a. Enlighten the habits of successful people according to Stephen Covey.
OR
b. Explain the roles of senior management in successful implementation of TQM.
- 12 a. Describe the Juran Trilogy in detail with diagram.
OR
b. Explain in detail the 5S concept with its factors and benefits.
- 13 a. a) Differentiate matrix diagram and matrix data analysis diagram.
b) Differentiate tree diagram and decision tree diagram.
OR
b. Discuss the characteristics of normal curve.
- 14 a. Discuss in detail the quality function development with suitable diagram.
OR
b. Write the step by step procedure for implementing FMEA of a product.
- 15 a. Explain the various stages of quality auditing.
OR
b. Discuss in detail the benefits of ISO 14000.

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018

AERONAUTICAL ENGINEERING

FIFTH SEMESTER

ELECTIVE - AIR TRAFFIC CONTROL AND AERODROME DESIGN

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define Various kinds of separation.
- 2 What are the Designation of ATS?
- 3 Write about lateral separations based on time and distance
- 4 Write about longitudinal separations based on time and distance
- 5 Write about co-ordination between non radar controls?
- 6 Write about emergency procedures?
- 7 Define Aerodrome data?
- 8 Define obstacles restriction.
- 9 What is the use of landing direction indicator in aircraft?
- 10 Name some of the Aerodrome beacon?

PART-B (5 x 16 = 80)

- 11 a. Write a detail about Flight information Service (FIS)
OR
b. Write a detail about Establishment, designation and identification of units providing ATS
- 12 a. Explain about (RNP) Required navigation performance
OR
b. Write about navigational system with a neat sketch
- 13 a. What are the use of radar in area and approach control services

OR

(p.t.o)

b. Write a detail about Alerting service.

14 a. Write in detail about Aerodrome reference temperature?

OR

b. Explain in detail about the airport mapping data and its advantages.

15 a. Explain in detail about the general requirements and various markings used in signal area?

OR

b. Explain in detail about the Simple approach lighting system and various lighting systems?

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E. DEGREE EXAMINATION- APRIL /MAY - 2018
AERONAUTICAL ENGINEERING
Sixth Semester

ARCRAFT STABILITY AND CONTROL
(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is meant by controllability?
2. What is stick free stability?
3. What is meant by 'Weather Cock Stability'?
4. What is rudder control ineffectiveness?
5. What is mean by dihedral effect?
6. What are the lateral controls available in aircraft?
7. What is mean by longitudinal stability?
8. Why airplanes do requires vertical tail?
9. Define spiral divergent?
10. What is the main reason for the spin of aircraft?

PART-B (5 x 16 = 80 Marks)

- 11.a) Explain in detail about the longitudinal static stability.

OR

- b) Explain in detail about the Power effect on stability by propeller aircrafts.

- 12.a) What is the contribution to static directional stability by wing?

OR

- b) What is the contribution to static directional stability by tail?

- 13.a) Explain about the Load Factors on aircraft due to Banking.

OR

- b) Describe coupling between rolling and yawing moments?

- 14.a) Derive the continuity equation for aircraft motion?

OR

- b) Explain in detail about Routh's stability criterion.

- 15.a) Explain briefly about auto rotation.

OR

- b) Explain about the various controls and their contribution in different stability.

**VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)**

**B.E. DEGREE EXAMINATION- APRIL /MAY - 2018
AERONAUTICAL ENGINEERING**

Sixth Semester

**AIRCRAFT MATERIALS AND PROCESSES
(Candidates admitted under 2015 Regulations - CBCS)**

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is meant by crystal imperfections?
2. What to you understand the term phase diagram?
3. What is meant by fatigue fracture?
4. What are alloy steels? How are steel classify?
5. What is meant by rust?
6. What is meant by annealing?
7. State the limitation of powder metallurgy.
8. What is meant by shape memory alloys?
9. What is meant by Modern Super alloy?
10. Give the various testing methods to find properties.

PART-B (5 x 16 = 80 Marks)

- 11.a) What are Miller indices? Explain how they are determined with any two planes in a SC structure. Give their significance.

OR

- b) Describe in detail about Schottky defect and Frenkel defect.

- 12.a) What is fatigue failure? How fatigue test is carried out with detail explain.

OR

- b) What are the importance of composite materials and explain the applications in aircraft industries.

- 13.a) Explain in detail about the mechanism of corrosion.

OR

- b) Explain in detail, how aluminum based alloys heat treated.

- 14.a) Why powder metallurgy is important in manufacturing process. State the advantages, limitations and applications.

OR

- b) Explain any one manufacturing methods of ceramic matrix composites.

- 15.a) What is creep curve? Explain various stages of creep.

OR

- b) Explain in detail various Phases in Superalloys.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E. DEGREE EXAMINATION- APRIL /MAY - 2018
AERONAUTICAL ENGINEERING
Sixth Semester
AIRCRAFT GENERAL ENGINEERING AND MAINTANANCE PRACTICES
(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions**PART – A (10 x 2 = 20 Marks)**

1. What is meant by towing?
2. What are the various types of fires?
3. State the purpose of cabin pressurization.
4. What is a portable oxygen system?
5. What is material safety data sheet?
6. Mention the two types of aviation fuel used?
7. What is maintenance manual?
8. What is a preflight inspection?
9. List the types of special wrenches.
10. Name the material used for fabrication of aircraft nuts.

PART-B (5 x 16 = 80 Marks)

- 11.a) Write in detail about aircraft leveling procedure.

OR

- b) Write the difference between turboprop and turbojet engine.

- 12.a) Explain vapor- cycle cooling system with a suitable sketch.

OR

- b) Explain supercharger and turbocharger in detail.

- 13.a) What are the precautions to be taken when working with electrical equipments?

OR

- b) What the specific functions to prevent corrosion?

- 14.a) What is inspection of an aircraft? Explain the importance of inspection with respect to safety of flight.

OR

- b) What is an aircraft log? Explain in detail.

- 15.a) What are general purpose tools? Explain in detail.

OR

- b) Write notes on non-metallic aircraft materials.

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E. DEGREE EXAMINATION- APRIL /MAY - 2018
AERONAUTICAL ENGINEERING

Sixth Semester

ELECTIVE - CRYOGENIC ENGINEERING

(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours

Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is the necessity of studying engineering materials?
2. Define Avogadro number.
3. What is called internal work method?
4. What is called lambda line?
5. What is the other name for boiler in Cryogenic Engineering?
6. What is equilibrium line?
7. Define thermal conductivity.
8. List any two application of vacuum technology.
9. Write abbreviation for ASME.
10. What is natural gas?

PART-B (5 x 16 = 80 Marks)

11.a) Explain any five areas involved in Cryogenic Engineering.

OR

b) Explain Meissner effect with neat sketch.

12.a) Explain thermodynamic ideal system with neat sketch.

OR

b) Explain simple Linde Hampton system

13.a) Explain briefly about the types of rectification column.

OR

b) Explain the working principle of neon separation system.

14.a) Explain magnetic thermometer with neat sketch.

OR

b) Explain evacuated powder and fiber insulation.

15.a) List out the important steps to design inner vessel in storage system.

OR

b) Explain different types of draining.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AERONAUTICAL ENGINEERING
SEVENTH SEMESTER
AVIONICS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Explain “illities” of Avionics system.
- 2 Define DR navigation
- 3 Explain Federated architecture.
- 4 What is simplex and half duplex communication?
- 5 Explain CRT and its usage in aircraft displays.
- 6 Mention the application of touch screen.
- 7 What is Flight control system?
- 8 Explain Electronic warfare.
- 9 What is Altitude warning?
- 10 Explain GBAS?.

PART-B (5 x 16 = 80)

- 11 a. Describe the various ‘illities’ in Avionics systems.

OR

 b. Explain clearly the design procedure that is adopted in Avionics system design.
- 12 a. Explain MIL STD 1553 B data bus in detail bring out clearly the bus architecture, protocol, word and message formats and coupling methods.

OR

 b. Explain about MIL STD word formats.
- 13 a. What is DVI? What are special features of DVI?

OR

 b. Explain MFKs, HMD, HUD and HDD in detail.
- 14 a. Compare LORAN, DECCA, OMEGA & Explain its Application.

OR

 b. Explain Conventional Flight control system and advantage of FBW to overcome the disadvantage of Conventional FCS.
- 15 a. Explain speed in Vertical & compare various air system.

OR

 b. Explain in detail about Automatic Flare Control loop.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AERONAUTICAL ENGINEERING
SEVENTH SEMESTER
WIND TUNNEL TECHNIQUES

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 What are the applications of dimensional homogeneity?
- 2 Define kinematic similarity
- 3 What are the disadvantages of closed return wind tunnel?
- 4 What are the two criteria should want to consider when starting the wind tunnel design?
- 5 Differentiate between supersonic and subsonic wind tunnel?
- 6 Explain about the operating range.
- 7 Discuss the advantage of manometers?
- 8 What is three component balances?
- 9 Explain about Dye techniques?
- 10 Write the process of Interferometer?

PART-B (5 x 16 = 80)

- 11 a. Explain about graphical description of fluid motion.
OR
b. Briefly explain about Gas Dynamics.
- 12 a. Briefly explain about the layouts of closed circuit wind tunnel.
OR
b. Explain about Instrumentation and Calibration of Wind Tunnel.
- 13 a. Describe about the calibration of subsonic tunnels
OR
b. Explain briefly about the determination of turbulence level in hypersonic speed
- 14 a. Briefly explain about the three component balance
OR
b. Discuss briefly about the velocity measurement
- 15 a. Explain about the optical method of flow visualization
OR
b. Detail physical principles involved in the visualization of fluid motion

VINAYAKA MISSIONS RESEARCH FOUNDATION
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B.E.DEGREE EXAMINATIONS- NOV/DEC - 2018
AERONAUTICAL ENGINEERING
SEVENTH SEMESTER
ELECTIVE - HIGH TEMPERATURE MATERIALS
(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions**Part-A (10 x 2 =20 Marks)**

- 1 What are the metallurgical factors influencing creep in various stages?
- 2 Explain about fatigue failure?
- 3 What is mean by creep time?
- 4 Name some of the equipment which is used to draw the stress-strain curve?
- 5 Write about cleavage fracture.
- 6 Write about corrosion.
- 7 How metals are corroding?
- 8 Define Pilling.
- 9 What are Super alloys?
- 10 Why characterization test is important for high temperature application?

PART-B (5 x 16 = 80)

- 11 a. Explain the various stages of material failure at elevated temperature?
OR
b. What is fatigue failure? How fatigue test is carried out with detail explain.
- 12 a. Explain briefly about the various types of hardening methods?
OR
b. Briefly discusses about the various material stress strain curve?
- 13 a. Explain in detail about fracture maps for different alloys with suitable diagram.
OR
b. Draw and explain the fracture maps for aluminium with suitable diagram
- 14 a. Explain in detail about the mechanism of corrosion.
OR
b. Explain about Pilling Bed worth ratio.
- 15 a. Briefly discusses about the Iron based and nickel based super alloys.
OR
b. Explain Service Temperatures for Superalloys in detail.

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- NOV/DEC- 2018
ELECTIVE - NANO TECHNOLOGY
AERONAUTICAL ENGINEERING
SEVENTH SEMESTER

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours

Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

- 1 Define Nanoscience and Nanotechnology.
- 2 List out any two factors on implication of nanotechnology in daily usage?
- 3 What are the advantages and disadvantages of Ball milling method?
- 4 Define: contamination
- 5 Define fracture toughness
- 6 What is Acousto-optic effect?
- 7 What is meant by PECVD?
- 8 Define electron beam lithography.
- 9 Write the principle of LED.
- 10 What are bio-hazards?

PART-B (5 x 16 = 80)

- 11 a. Explain the applications of nanotechnology in health care, medicine and sports.
OR
b. Describe the recent trends in nanoscience and technology in the field of textile, agriculture and medicine.
- 12 a. Explain the Sol-gel method of synthesizing nanoparticles in detail.
OR
b. Mention the various safety issues concerned in adapting Nanotechnology in our life? Explain the risks involved for a person working in a nanolaboratory.
- 13 a. Describe the nano crystalline in SiC
OR
b. Explain how the change in length scale affects mechanical properties of a material.
- 14 a. Write briefly about methodology of nano-Phase deposition.
OR
b. Explain the working of Electron beam lithography in detail with a neat diagram.
- 15 a. Explain in detail about Biosensors with its application.
OR
b. List out the preventive measures to be adopted for avoiding chemical and biological contamination in the synthesis of nanoparticles.
